# DOCUMENT RESUME

ED 146 182 95 TM 006 537

AUTHOR Hoepfner, Ralph; And Others
TITLE The Sample for the Sustaining Effects Study and Projections of its Characteristic to the National Population. Technical Report No. 1 from the Study of Sustaining Effects of Compensatory Education on Basic Skills.
INSTITUTION System Development Corp., Santa Monica, Calif.
SPONS AGENCY Office of Education (DHEW), Washington, D.C. Office of Planning, Budgeting, and Evaluation.
PUB DATE Jun 77
CONTRACT 300-75-0332
NOTE 144p.; For related document, see TM 006 538

EDRS PRICE MF-$0.83 HC-$7.35 Plus Postage.
DESCRIPTORS Academic Achievement; Basic Skills; *Compensatory Education Programs; Disadvantaged Youth; Economic Disadvantagement; Economic Status; Educational Mobility; Elementary Education; Elementary Schools; *Elementary School Students; Enrollment; Ethnic Groups; Federal Aid; Longitudinal Studies; Low Achievers; Minority Groups; *National Surveys; Participant Characteristics; Principals; Program Evaluation; Public Schools; *Sampling; Statistical Analysis; *Student Characteristics; Summer Schools; Tables (Data); Urban Schools
IDENTIFIERS *Sustaining Effects Study

ABSTRACT

Sampling techniques used in "A Study of the Sustaining Effects of Compensatory Education" are described in detail. The Sustaining Effects Study is a large, multi-faceted study of issues related to the compensatory education of elementary school students. Public elementary schools that include grades between one and six are eligible for the national study. The results of a survey completed by 4,750 school principals are included. The data provide accurate descriptions of the nation's public elementary schools in terms of: (1) school characteristics, such as urbanism, enrollment, and range of grades provided; (2) types of services provided to the students, such as summer programs; and (3) student characteristics, such as race, achievement level, and economic status. Interrelationships among these characteristics are also presented. (Author/MV)

***********************************************************************
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
***********************************************************************

ED146182

TM006 537

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

# REPORT #1:
# THE SAMPLE FOR THE SUSTAINING EFFECTS STUDY AND PROJECTIONS OF ITS CHARACTERISTICS TO THE NATIONAL POPULATION

Ralph Hoepfner
Jean Wellisch
Henry Zagorski

# THE SAMPLE FOR THE SUSTAINING EFFECTS STUDY AND PROJECTIONS OF ITS CHARACTERISTICS TO THE NATIONAL POPULATION

RALPH HOEPFNER
HENRY ZAGORSKI
JEAN B. WELLISCH

TECHNICAL REPORT #1 FROM THE
STUDY OF THE SUSTAINING EFFECTS OF COMPENSATORY EDUCATION ON BASIC SKILLS

PREPARED FOR
OFFICE OF PLANNING, BUDGETING, AND EVALUATION
U.S. OFFICE OF EDUCATION

BY

SYSTEM DEVELOPMENT CORPORATION
2500 COLORADO AVENUE
SANTA MONICA, CALIFORNIA 90406

JUNE 1977

2

## REPORTS IN THE STUDY OF SUSTAINING EFFECTS OF COMPENSATORY EDUCATION SERIES

1. Hoepfner, Ralph; Zagorski, Henry; and Wellisch, Jean. The Sample for the Sustaining Effects Study and Projections of its Characteristics to the National Population. System Development Corporation, Santa Monica, California, June 1977.

The work reported in this series was performed under Contract No. OE 300-75-0332 with the U.S. Office of Education. The Office of Education encourages contractors to express their professional judgment in reports. The opinions, conclusions, and recommendations in these reports are those of the authors and do not necessarily represent Office of Education positions or policy.

## THE STAFF OF THE STUDY OF SUSTAINING EFFECTS

### SYSTEM DEVELOPMENT CORPORATION:

**Project Management.** Launor F. Carter, Director; Raymond B. Stewart, Associate Director; Thomas F. Collins, Assistant Director for Planning and Control; Marilyn M. Stevenson.

**Design and Analysis.** Ralph R. Hoepfner, Manager; Charles E. Kenoyer (1975-1976); Henry J. Zagorski; Ming-Mei Wang (1976-        ); Ray W. Baker; Mary Jean Austin; John McCall; Lewis Zamora.

**Instrumentation and School Characteristics.** Jean B. Wellisch, Manager; Ralph Melaragno (1975-1976); Ronald Carriere.

**Field Operations.** Dean R. Lee, Manager; Cleone R. Geddes; Cynthia C. Hull; Thomas A. Ramirez, John R. Shiban (1975-1976).

**Distribution and Scoring.** Patrick F. Carnes, Manager; Carl Molitor (1975-1976); Loren Southworth; Stanley A. Dounn.

**Editorial and Publications.** Kean Mantius, Manager; Una Vere Katter.

### DECIMA RESEARCH:

**Participation Study.** Vincent J. Breglio, Manager; Ronald H. Hinckley; Timothy McGrew; Claudia Washburn; Wesley White.

### RMC RESEARCH CORPORATION:

**Cost/Effectiveness and Summer Study.** Sue A. Haggart, Manager; Laurence A. Dougharty; Leonard S. Klibanoff; Nabeel Al-Salam.

### PACIFIC CONSULTANTS:

**Functional Effectiveness Measures.** Mary Spencer, Manager; David Bessemer; Micholar Fedan; Bobby Offortt.

### U.S. OFFICE OF EDUCATION:

**Office of Planning, Budgeting, and Evaluation.** George W. Mayeske, Project Officer; Janice K. Anderson, Deputy Project Officer; Kathryn E. Crossley, Administrative Assistant.

**Division of Education for the Disadvantaged.** William Lobosco, Paul Miller, Velma James.

## SUSTAINING EFFECTS STUDY ADVISORY GROUPS AND PANELS

**Policy Advisory Group.** Edward Boddy, Oteal Bowen, Leo Doherty, Shirley Foster, Joe Hansen (1975-1976), Walter Hathaway (1975-1976), Rio Rita Jackson, Robert Lamborn, Celia Martin, Roberta Martinez, Lucy Matos, Miles Myers, Thomas Ralls, Stanley Rumbaugh, Alexander Sergienko, Kenneth Smith, Patricia Williams.

**Research Advisory Group.** Donald Campbell, William Cooley, Rex Fortune, William Michael, Alex Mood, Melvin Novick, David Wiley.

**Panel on Achievement Tests.** William Coffman, Melvin Seeman, Floraline Stevens, Ralph Tyler, James Vasquez.

**Panel on Bias in Evaluation.** Thomas F. Pettigrew, Benjamin J. McCullough, Daniel O'Neal, Frank Navarette, Ricardo Chapa, Florida Catchins Hyde, Dorothy Peterson, Takako Okubo, Elma Bertram, Don Manalili.

**Panel on Functional Literacy.** Marilyn Lichtman, James Saunders, Thomas Sticht, James Vasquez.

**Panel on Affective Measures.** Joyce Levy Epstein, John Kitsuse, Melvin Seeman, James Vasquez.

**Panel on Innovative Compensatory Projects.** Mary Bentzen, William Coffman, William Georgiades, John Peper, Ralph Tyler.

6

The authors wish especially to acknowledge the cooperation of the schools that supplied the information upon which much of this report is based. In addition, the Research Advisory Committee offered many suggestions that made the sample more generally useful. Within SDC, the Field Operations group secured and maintained contact with the schools and the Design and Analysis group quality-controlled and analyzed the data. This report would not have been possible without the help of all these groups, but the authors take full responsibility for the way the results are reported and interpreted.

## TABLE OF CONTENTS

Page

List of Tables . . . viii

List of Figures . . . xiii

Overview . . . xv

Chapter

Part I. The Sample for the Sustaining Effects Study . . . 1

I. The Sampling Plan . . . 3

II. The Principal Sample . . . 6

III. The Respondent Sample . . . 24

IV. The First-Year Representative Sample . . . 38

V. Special Samples . . . 61

VI. The Combined First-Year Samples . . . 71

Part II. Population Projections of School and Student Characteristics . . . 78

VII. Descriptive Projections From the Principal Sample to the Population . . . 80

References . . . 125

# LIST OF TABLES

| Table | | Page |
|---|---|---|
| II-1 | SDC Evaluation of Available Data Bases | 8 |
| II-2 | The Ten Standard Federal Regions, Their Constituent States, and Descriptive Names | 10 |
| II-3 | Numbers and National Percentages of Children, Aged 5 Through 17, Associated With LEAs in Each of the Ten Standard Federal Regions | 12 |
| II-4 | The Number of LEAs in Each LEA-Size Stratum, the Number of Students in Each Stratum, and the Percentage of All Students in the Data Base in Each Stratum | 13 |
| II-5 | The Number of LEAs in Each Poverty-Level Stratum, the Number of Students in Each Stratum, and the Percentage of All Students in the Data Base in Each Stratum | 16 |
| II-6 | The Number and the Proportion of Qualifying Schools (At Least One Grade in the 1-6 Range) for Each of the 90 Cells of the Sampling Matrix | 22 |
| III-1 | Sample Maintenance Analyses | 32 |
| IV-1 | Comparison of Drop-Out and Replacement Schools by Urbanism | 40 |
| IV-2 | Comparison of Drop-Out and Replacement Schools by Student Enrollment | 41 |
| IV-3 | Comparison of Drop-Out and Replacement Schools by Grade Range | 41 |
| IV-4 | Comparison of Drop-Out and Replacement Schools by Student Race/Ethnicity | 42 |
| IV-5 | Comparison of Drop-Out and Replacement Schools by Student Achievement Level | 43 |
| IV-6 | Comparison of Drop-Out and Replacement Schools by Poverty Percentages | 43 |
| IV-7 | Comparison of Drop-Out and Replacement Schools by Compensatory Funding | 44 |
| IV-8 | Comparison of Drop-Out and Replacement Schools by Student-Body Stability | 44 |
| IV-9 | Comparison of Drop-Out and Replacement Schools by Incidence of Combined Grades | 45 |
| IV-10 | Distribution of the 243 Schools in the First-Year Representative Sample by Region, Size of LEA, and LEA Poverty Status | 46 |
| IV-11 | Comparison of Projected Percentages of Schools by Degree of Urbanism | 47 |
| IV-12 | Comparison of Projected Percentages of Schools by Category of Student-Body Stability | 48 |

## LIST OF TABLES (Continued)

Table Page

IV-13 Comparison of Projected Numbers of Students by Enrollment, Race/Ethnicity, and Poverty ... 49

IV-14 Comparison of Projected Percentages of Schools by Type of Grade Span ... 51

IV-15 Comparison of Projected Percentages of Schools Receiving Compensatory Funds from Various Sources ... 51

IV-16 Comparison of Projected Percentages of Students Reading One Year or More Below Grade Level and of Schools With Combined Grades and With Summer School ... 52

IV-17 Numbers of Schools and Students in Each Population Cell Used for Weighting Sample Projections ... 56

V-1 Distribution of the 29 Schools in the Comparison Sample by Region, Size of LEA, and LEA Poverty Status ... 62

V-2 Type of Programs (Unusual Components) for Schools at Two Stages of the Nominated Sample ... 68

V-3 Distribution of the 43 Schools in the Nominated Sample by Region, Size of LEA, and LEA Poverty Status ... 69

V-4 Distribution of the 14 Feed Schools by Region, Size of LEA, and LEA Poverty Status ... 70

VI-1 Distribution of the First-Year Sample Over the Dimensions of the Sampling Matrix ... 72

VI-2 Distribution of the First-Year Sampling Among the States ... 73

VI-3 Distribution of the First-Year Sample Schools on Urban-Suburban-Rural Dimension ... 74

VI-4 Distribution of the First-Year Sample Schools on Concentration of Enrollment in Five Racial/Ethnic Groups ... 75

VI-5 Distribution of the First-Year Sample Schools on Percentage of Students One or More Years Below Grade Level in Reading ... 75

VI-6 Distribution of the First-Year Sample Schools on Percentage of Poor Students ... 76

VI-7 Distribution of the First-Year Sample Schools on Source of Compensatory Funds Received ... 77

VII-1 Estimated Enrollments (in Thousands) by Grades of U.S. Public Schools ... 82

VII-2 Projected Numbers and Percentages of U.S. Public Schools With Grades 1-6 by Population Density of Location ... 83

Table | | Page
VII-3 Projected Percentage of Schools by 1-6 Enrollment and Urbanism ..... 84

VII-4 Projected Percentages of Schools by Grade Range and Urbanism ...... 85

VII-5 Projected Numbers and Percentages of U.S. Public Schools With Grades in 1-6 Range by Percentage of Students Reading One or More Years Below Grade Level ........ 86

VII-6 Projected Percentages of Schools With Grades in the 1-6 Range by Low-Achievement Rate and Enrollment ........ 87

VII-7 Projected Percentages of Schools With Grades in the 1-6 Range by Rate of Low-Achievement and Urbanism ........ 87

VII-8 Projected Numbers and Percentages of U.S. Public Schools With Grades in the 1-6 Range by Source of Compensatory-Education Funds Received ........ 88

VII-9 Projected Percentages of Schools With Grades in the 1-6 Range by Source of Compensatory Funds Received and Enrollment ........ 89

VII-10 Projected Percentages of Schools With Grades in the 1-6 Range by Source of Compensatory Funds Received and Urbanism ........ 89

VII-11 Projected Percentages of Schools With Grades in the 1-6 Range by Source of Compensatory Funds Received and Range of Grades Provided ........ 90

VII-12 Projected Percentages of Schools With Grades in the 1-6 Range by Source of Compensatory Funds Received and Incidence of Combined-Grade Classrooms ........ 91

VII-13 Projected Percentages of Schools With Grades in the 1-6 Range by Student Poverty Level and Source of Compensatory Funds Received .... 92

VII-14 Projected Percentages of Schools With Grades in the 1-6 Range by Source of Compensatory Funds Received and Minority Concentration ........ 93

VII-15 Projected Percentage of Schools With Grades in the 1-6 Range by Source of Compensatory Funds Received and Rate of Low Achievement ........ 93

VII-16 Projected Percentages of Schools With Grades in the 1-6 Range by Source of Compensatory Funds Received and Stability of Student Body ........ 94

VII-17 Projected Numbers and Percentages of U.S. Public Schools With Grades in the 1-6 Range by Percentage of Poverty Students ........ 95

VII-18 Projected Percentages of Schools by Student Poverty Level and Enrollment ........ 96

## LIST OF TABLES (Continued)

Table Page

VII-19 Projected Percentages of Schools With Grades in the 1-6 Range by Student Poverty Level and Urbanism ........................ 97

VII-20 Projected Percentages of Schools With Grades in the 1-6 Range by Student Poverty Level and Minority Concentration ................ 97

VII-21 Projected Percentages of Schools With Grades in the 1-6 Range by Student Poverty Level and Range of Grades Provided ................ 98

VII-22 Projected Percentages of Schools With Grades in the 1-6 Range by Student Poverty Level and Low-Achievement Rate ................ 98

VII-23 Projected Percentages of Schools With Grades in the 1-6 Range by Student Poverty Level, Low-Achievement Rate, and Source of Compensatory Funds Received ........................ 99

VII-24 Projected Numbers and Percentages of Students Enrolled in U.S. Public Schools With Grades in the 1-6 Range by Racial/Ethnic Group ........ 101

VII-25 Comparison of Racial/Ethnic Percentages from HEW/OCR Directory and Projections from the Principal Sample ........................ 101

VII-26 Projected Percentages of Schools With Grades in the 1-6 Range by Low-Achievement Rate and Minority Concentration ................ 102

VII-27 Projected Percentages of Schools With Grades in the 1-6 Range by Low-Achievement Rate, Minority Concentration, and Student Poverty Level ........................................ 103

VII-28 Projected Frequencies of U.S. Public Schools With Grades in the 1-6 Range by Grades Served ........................................ 106

VII-29 Projected Numbers and Percentages of U.S. Public Schools With Grades in the 1-6 Range that Operate Classrooms With Combined Grades ..... 106

VII-30 Projected Percentages of Schools With Grades in the 1-6 Range by Incidence of Combined Grades and Enrollment ........................ 107

VII-31 Projected Percentages of Schools With Grades in the 1-6 Range by Incidence of Combined Grades and Range of Grades Provided ........ 108

VII-32 Projected Percentages of Schools With Grades in the 1-6 Range by Incidence of Combined Grades and Urbanism ........................ 109

VII-33 Projected Percentage of Schools With Grades in the 1-6 Range by Student Poverty Level and Combined-Grade Classrooms ................ 109

VII-34 Projected Percentages of Schools With Grades in the 1-6 Range by Incidence of Combined Grades and Minority Concentration .......... 110

VII-35 Projected Percentages of Schools With Grades in the 1-6 Range by Low-Achievement Rate and Range of Grades Provided ................ 111

## LIST OF TABLES (Continued)

Table | Page

VII-36 Projected Percentages of Schools With Grades in the 1-6 Range by Incidence of Combined Grades and Rate of Low Achievement ........ 111

VII-37 Projected Numbers and Percentages of U.S. Public Schools With Grades in the 1-6 Range by Stability of Their Student Bodies .............. 112

VII-38 Projected Percentages of Schools With Grades in the 1-6 Range by Degree of Student Stability and Enrollment ........................ 112

VII-39 Projected Percentages of Schools With Grades in the 1-6 Range by Degree of Student Stability and Urbanism ........................ 113

VII-40 Projected Percentages of Schools With Grades in the 1-6 Range by Degree of Student Stability and Range of Grades Provided ........... 114

VII-41 Projected Percentages of Schools With Grades in the 1-6 Range by Student Poverty Level and Degree of Student Stability .............. 114

VII-42 Projected Percentages of Schools With Grades in the 1-6 Range by Degree of Student Stability and Minority Concentration ............ 115

VII-43 Projected Percentages of Schools With Grades in the 1-6 Range by Degree of Student Stability and Low-Achievement Rate ............ 115

VII-44 Projected Numbers and Percentages of U.S. Public Schools With Grades in the 1-6 Range by Availability of Summer School .......... 116

VII-45 Projected Percentages of Schools With Grades in the 1-6 Range by Availability of Summer Programs and Enrollment ................. 117

VII-46 Locations of Summer-School Programs for Schools in the Principal Sample That Reported Having Summer School Available ............ 117

VII-47 Types of Summer-School Programs for Schools in the Principal Sample That Reported Having Summer School Available ............ 118

VII-48 Projected Percentages of Schools With Grades in the 1-6 Range by Student Poverty Level and Availability of Summer Programs ......... 118

VII-49 Projected Percentages of Schools With Grades in the 1-6 Range by Availability of Summer Programs and Minority Concentration ........ 119

VII-50 Projected Percentages of Schools With Grades in the 1-6 Range by Availability of Summer Programs and Low-Achievement Rate ........ 120

VII-51 Projected Percentages of Schools With Grades in the 1-6 Range by Source of Compensatory Funds Received and Availability of Summer Programs .................................................. 120

VII-52 Sample Percentages of Schools by Types of Summer Programs Available and Enrollment ...................................... 121

VII-53 Sample Percentages of Schools With Grades in the 1-6 Range by Types of Summer Programs Available and Levels of Student Poverty ........ 121

## LIST OF TABLES (Continued)

| Table | | Page |
|---|---|---|
| VII-54 | Sample Percentages of Schools With Grades in the 1-6 Range by Type of Summer Programs Available and Concentration of Minority Students | 122 |
| VII-55 | Sample Percentages of Schools With Grades in the 1-6 Range by Type of Summer Programs Available and Rate of Low Achievement | 122 |
| VII-56 | Sample Percentages of Schools With Grades in the 1-6 Range by Type of Summer Programs Available and Source of Compensatory Funds Received | 123 |

## LIST OF FIGURES

| Figure | | Page |
|---|---|---|
| I-1 | Samples During the First Four Years of the Sustaining Effects Study | 5 |
| II-1 | Ten Geographic Strata of the Principal Sample | 11 |
| II-2 | Grouped Cumulative Frequency Distribution of LEAs by Size (Number of Students Enrolled) and by the Three Strata | 14 |
| II-3 | Grouped Cumulative Frequency Distribution of Students by Their LEA Poverty Indexes and the Points of Stratification | 17 |
| II-4 | Three-Dimensional Sampling Matrix | 18 |
| III-1 | School Information Questionnaire | 25 |
| VII-1 | The Relationship Between Poverty and Very Low Achievement for Four Levels of Minority Concentration | 105 |

# OVERVIEW

This is the first technical report of "A Study of the Sustaining Effects of Compensatory Education on Cognitive Skills." The first six chapters of the report, of particular interest to evaluation and research specialists, describe in technical detail the samples and how they were formed. Chapter VII presents the results of a survey completed by 4,750 principals of public schools with grades in the 1-6 range. Data are provided that allow accurate descriptions of the nation's public schools with grades 1-6 in terms of characteristics of the school, the kinds of services the schools provide to students, and the characteristics of the students. The interrelationships among these characteristics are also presented. This part of the report will be of special interest to readers concerned with problems of educational policy.

## The Sustaining Effects Study

The Sustaining Effects Study is a large, multi-faceted study of issues in the compensatory education of elementary school children. The different parts of the study can be summarized as follows:

*The Longitudinal Study.* In the Longitudinal Study, the educational achievements of a large number of children will be assessed in the fall and spring for three consecutive years. The children will take an achievement test in reading and mathematics, a functional literacy test, and a measure of attitude toward school and toward themselves as students. The amount and nature of instruction in reading and mathematics will be determined for each student four times during the school year. In addition, teachers and principals will report on their theories and practices of instruction and teaching. Thus, it will be possible not only to assess student growth over a three-year period, but to relate this growth to the kinds and amounts of instruction being received.

The schools in the study were drawn from three different groups. The **Representative Sample** of schools is a sample carefully drawn to represent all of the nation's public schools having some of the grades one through six. A second group of schools, the **Comparison Sample**, is composed of schools that have large proportions of students from high-poverty-level homes, but do not receive special funds to offer compensatory-education services. The third group is the **Nominated Sample**, composed of schools that were nominated because their instructional programs were thought to have promise as being unusually effective for low-achieving students. During the first operational year of the study, data will be collected from 343 schools and about 118,000 students.

*The Cost/Effectiveness Study.* Information is being obtained on the resources and services to which each student is exposed during reading and mathematics instruction. The costs of the resources and services are also being obtained. Because the effectiveness of the instructional programs will be determined as part of the Longitudinal Study, it will be possible to relate that effectiveness to the cost of each program.

*The Participation Study.* The purpose of the Participation Study is to determine the relationships among economic status, educational need, and instructional services received. The educational achievement of the students and the services they receive will be obtained in the Longitudinal Study, but the refined measures of economic status will be obtained in the Participation Study. A random sample of 15,000 students will be drawn and visits will be made to the homes of these students. During the visits, information will be collected on the economic level of the home and on the parents' attitudes toward their child's school and learning experiences. Thus, the level of student achievement and services received can be related to the economic level of the home from which the student comes.

*The Successful Sites Study.* At the end of the second year of the Longitudinal Study it will be possible to identify those schools that have been particularly successful in raising the achievement of their students. A sample of the most successful schools will be visited and studied in depth to identify the practices and programs that lead to student success. The programs will be described in detail so they can be considered for adoption at other schools.

## The Definition and Selection of the Samples

Chapter I describes the details of the sampling plan, and outlines the requirements of the sample in terms of the design of the study. Chapter II describes the Principal Sample and shows the way in which 5,035 schools were selected to provide a representative sample of public schools in terms of their geographic region, their size, and their poverty level. Chapter III describes the Respondent Sample; that is, the characteristics of those schools from which completed survey questionnaires were received. Of the 5,035 schools to which the survey was sent, information was obtained from 5,010; this is an exceptionally high response rate, but one which was essential to demonstrate that the final sample was truly representative. Of these, 4,750 schools were considered eligible. Chapter IV describes the way in which the final sample of 243 representative schools was selected, and reports many statistical tests that were applied to determine the extent to which these schools represent the nation's schools. Of all the tests applied, none reached a level of statistical significance that would indicate that these schools are in any way unrepresentative of the nation's schools. Chapter V describes the selection of the 29 schools with low funding for compensatory education and high student poverty, and the 43 schools that were nominated as having promising educational programs. Chapter V describes the resulting 343 schools in the combined samples for the first operational year of the study.

## A Description of the Nation's Schools Based on the Principal Survey

Through many follow-up letters and telephone calls for the survey questionnaire, response data were obtained for 4,750 eligible schools. These schools, when appropriately weighted, represent a very close approximation to the nation's public schools with grades 1-6, and thus we can report with confidence regarding the national characteristics of such schools. The survey form contained 15 information items and is reproduced in Chapter III. Based on the responses of the principals, an extensive analysis was performed and is reported in terms of seven major areas of interest. The highlights of each area are reported below.

*Enrollment, Urbanism, and Achievement.* Projections were made that estimated the total grade 1-6 enrollment in the 1975-76 school year as 20,881,979 students. These projections correspond closely to projections from other sources. The percentage of schools by degree of urbanism is shown below.

| Urbanism | Percentage of Schools |
|---|---|
| City over 500,000 | 6 |
| City of 200,000 to 500,000 | 4 |
| City of 50,000 to 200,000 | 11 |
| Suburb of city | 15 |
| City under 50,000 | 11 |
| Rural area near city | 25 |
| Rural area not near city | 28 |

Table VII-3 in Chapter VII shows the relationship between degree of urbanism and school enrollment to be moderately strong, with large cities having larger schools than rural areas, which tend to have small schools.

The principals reported on the percentage of their students who were reading one year or more below grade level, with the following results:

| Percentage of Students Reading One Year or More Below Grade Level | Percentage of Schools |
|---|---|
| 0–20 | 51 |
| 21–50 | 38 |
| 51–100 | 11 |

The level of student achievement is related to the degree of urbanism in a complex way, as indicated by the following tabulation, based on Table VII-7.

| Degree of Urbanism | Percentage of Schools With Half or More Students Reading One Year or More Below Grade Level |
|---|---|
| City of over 500,000 | 41 |
| City of 200,000 to 500,000 | 22 |
| City of 50,000 to 200,000 | 14 |
| Suburb of city | 3 |
| City under 50,000 | 6 |
| Rural area near city | 6 |
| Rural area not near city | 12 |

*Compensatory-Education Funds, School Characteristics, and Achievement.* The principals reported on whether their schools received compensatory-education funds and, if they did, the nature of those funds. The frequency of receipt of compensatory-education funds is:

| Compensatory Funds Received | Percentage of Schools |
|---|---|
| Title I funds only | 26 |
| Title I plus other funds | 41 |
| Other compensatory funds only | 14 |
| No special compensatory funds | 18 |

There is little relationship between the receipt of compensatory funds and the size of a school, although there is a relationship between degree of urbanism of the school and receipt of compensatory-education funds. Table VII-10 shows that small-city and rural schools tend to receive such funds more frequently than do large city schools. It should be noted that this relationship is relative to the receipt of funds and not to the amount of funds, about which we did not have information.

Schools with high percentages of poverty students tend to receive compensatory-education funds more than do schools with low percentages of poverty students. Nevertheless, a large number of schools with relatively few poverty students receive some compensatory-education funds, as illustrated by these results:

| Percentage of Poverty Students | Percentage of Schools Receiving Compensatory Funds |
|---|---|
| 0–20 | 72 |
| 21–50 | 90 |
| 51–100 | 95 |

Similarly, a school's receipt of compensatory-education funds is related to the percentage of minority students enrolled in the school.

| Percentage of Minority Students | Percentage of Schools Receiving Compensatory Funds |
|---|---|
| 0–19 | 79 |
| 20–49 | 82 |
| 50–79 | 92 |
| 80–100 | 93 |

Both poverty and minority status are related to achievement. It is not unexpected that the percentage of students reading one year or more below grade level is related to receipt of compensatory funds, as is shown from Table VII-15:

| Percentage of Students Reading One Year or More Below Grade Level | Percentage of Schools Receiving Compensatory Funds |
|---|---|
| 0–20 | 76 |
| 21–50 | 86 |
| 51–100 | 93 |

*Poverty and Achievement.* Principals were asked to report on the number of students in their schools who met the Title I poverty criteria or were eligible to receive free school lunches. The mean percentage of students reported as meeting these conditions was 28 percent, and their distribution by schools is:

| Percentage of Students Eligible for Title I or for Free Lunches | Percentage of Schools |
|---|---|
| 0–20 | 52 |
| 21–50 | 32 |
| 51–100 | 16 |

Table VII-18 shows that schools with high enrollments tend to have a high percentage of poverty students; Table VII-19 shows both that large cities have a high percentage of poverty students and that there is a relatively high percentage of poverty students in rural areas not near cities.

The relationship between poverty and percentage of students reading one year or more below grade level is quite strong, as is shown by these data from Table VII-22.

| Percentage of Students Reading One Year or More Below Grade Level | Percentage of Schools Reporting 51–100 Percent Poverty Students |
|---|---|
| 0–20 | 4 |
| 21–50 | 18 |
| 51–100 | 66 |

Table VII-23 relates schools' low-achievement rates, poverty, and receipt of compensatory-education funds. The relationships are quite strong and generally show that, as there is an increase in percent of poverty students and as the percent of students reading one year or more below grade level increases, there is a marked increase in receipt of compensatory-education funds.

*Minority Membership and Achievement.* Projections of the racial/ethnic composition of the 21 million students in grades 1-6 are shown below.

| Racial/Ethnic Group | Percentage of Grades 1-6 Population |
|---|---|
| American Indian | 1 |
| Asian-American | 1 |
| Black | 16 |
| Spanish Heritage | 6 |
| White | 76 |

In Chapter VII it is shown that these percentages correspond very closely with projections from other sources.

There is a significant relationship between the concentration of minority students in a school and the percentage of low-achieving students. For example:

| Percentage of Minority Students | Percentage of Schools Reporting Half or More of Their Students Reading One Year or More Below Grade Level |
|---|---|
| 0–19 | 3 |
| 20–49 | 12 |
| 50–79 | 36 |
| 80–100 | 57 |

Table VII-27 expands this relationship by relating achievement, minority concentration, and poverty. It shows that, as the percentage of students from minorities and from poverty families increases, the percent of low-achieving students increases.

*The Characteristics of Public Schools With Grades 1-6.* This section presents information on the characteristics of public schools with grades 1-6 in terms of the frequencies of schools with complete elementary grades, schools with missing upper grades that feed into schools with higher grades, schools that have only lower grades, and schools that have only middle grades. Information is also presented on schools that have combined grades. These characteristics are interrelated and also compared to size of school, degree of urbanism, poverty level, percentage of minority students, and level of achievement. Generally, these relationships are small, although there is a tendency for small-city schools and rural schools to have more combined grades, and a tendency for a greater incidence of combined grades as the concentration of poverty and minority students increases. Similarly, there is a tendency for the incidence of combined grades to increase as the percentage of students reading one year or more below grade level increases.

*Three-Year Stability of Student Body.* The principals of the schools were asked to provide estimates of the three-year stability (non-mobility) of their student bodies. The results are:

| Percentage of Students Remaining in School at Least Three Years | Percentage of Schools |
|---|---|
| 0–60 | 17 |
| 61–80 | 23 |
| 81–100 | 59 |

Schools tend to have less stability in their student bodies as the size of the school increases, and there tends to be less stability in large cities. Similarly, stability decreases as the percent of poverty and minority concentration increases. As might be expected, there is also a tendency for the percent of students reading one year or more below grade level to increase as stability of student body decreases.

*Summer Schools: Their Availability and Programs.* Fifty-one percent of the nation's schools with grades 1-6 have summer-school programs available for their students. Larger schools provide summer-school programs more frequently than smaller schools do. Of those schools surveyed that had summer-school programs, 52 percent had compensatory programs only, 13 percent had regular or enriched programs only, and 35 percent had both types of programs. There is practically no relation between the availability of summer school and a school's level of poverty, minority concentration, or level of achievement of the students. Schools that do not receive compensatory-education funds are slightly more likely to provide summer school for students than schools that do receive such funds. However, if a school has a summer program and receives Title I or other compensatory funds, then such schools are likely to have compensatory education as part of their summer program. If there is a summer-school program, then there is a slight tendency for compensatory programs to be more available as the concentration of poverty students, minority students, and low-achieving students increases.

This description of the nation's schools gives only a flavor of the results reported in Chapter VII, where detailed discussions and complete tables are presented.

# PART I. THE SAMPLE FOR THE SUSTAINING EFFECTS STUDY

# CHAPTER I. THE SAMPLING PLAN

The study design for the Sustaining Effects Study calls for both descriptive and analytic efforts; therefore, the sample selected to provide information for the study must fulfill both purposes. Each of these efforts makes special demands upon the characteristics of the sample. Although the two sets of demands are not mutually exclusive, conflict occurs at several stages in the course of the development of the plan.

The areas of conflict can be seen more clearly if the goals of each of the two major efforts are described briefly. The descriptive aspect of the study has as its goal the accurate projection of sample characteristics to the entire nation, so that governmental decision-makers will have an accurate picture of the nature, extent, and distribution of compensatory-education efforts. The remaining aspects of the study belong in the analytic category, in which analysis will uncover relationships and comparisons among various recipients, programs, costs, durations, and extents of compensatory education.

For description, the ideal sampling scheme is representative. The sample should be randomly drawn after it has been as completely and proportionally stratified as possible to assure representation of all variations of the characteristics of concern. These representations of the variations can then be weighted to reflect the national profile with extreme accuracy, thus providing highly accurate information about the state of affairs, accompanied by refined measures of the amount of error to be expected in the estimates. The projections to a national profile and the computation of error estimates are dependent upon both random sampling and exact knowledge of any disproportionalities introduced by the stratification dimensions.

To meet the needs of the analytic efforts, the sampling plan should stress adequate and wide representation of each of the groups to be compared or of each of the variables to be related or compared. The sample, therefore, instead of being representative of the nation's population, should represent the variations in all the characteristics and groups that are of concern. A wide range of values of the variables or types of groups will maximize the sensitivity of the analytic techniques.

With these two sometimes contradictory sets of sample requirements in mind, a sampling plan was developed to meet all the study requirements in an optimal manner. This plan consists of the following four phases:

> *The Principal Sample:* An initial sample of 5,035 schools representing the nation, with specific emphasis (disproportionality of strata) upon schools likely to receive compensatory-education funds. Because the Principal Sample is expected to undergo attrition, it represents an over-sampling in order to provide the base for later sampling stages.

> *The Respondent Sample:* The Principal Sample, reduced by those schools that did not respond to mail-survey or telephone-interview attempts. Checks were made to determine the amount and nature of bias introduced at the respondent phase.

*The First-Year Sample:* A sample of 329 schools,* partly selected randomly from the **Respondent Sample** and partly selected purposively from the nation's schools. This sample is composed of five groups of schools. Groups A and B are the Representative Sample of 243 schools that are randomly selected to represent the entire nation. Examination of the school data base indicated that approximately two-thirds of the schools that include elementary grades contain all of the grades 1 through 6; the other third lacks one or more of the grades in the 1-through-6 span.

Group A contains 67 schools that do not contain the full grade span.

Group B contains 176 schools with all six grades from 1 through 6.

Group C is composed of 29 schools specifically selected because they have high poverty and low compensatory-education funding (an important comparison group, but unlikely to be included in sufficient numbers by random-selection methods). This group is called the **Comparison Sample**.

Group D is composed of 43 schools specifically selected to exemplify promising approaches to the education of disadvantaged students. This group of schools is called the **Nominated Sample**.

Group E, the **Feeder-Fed Sample**, contains 14 schools that either feed into, or are fed from, some of the schools in Group A.

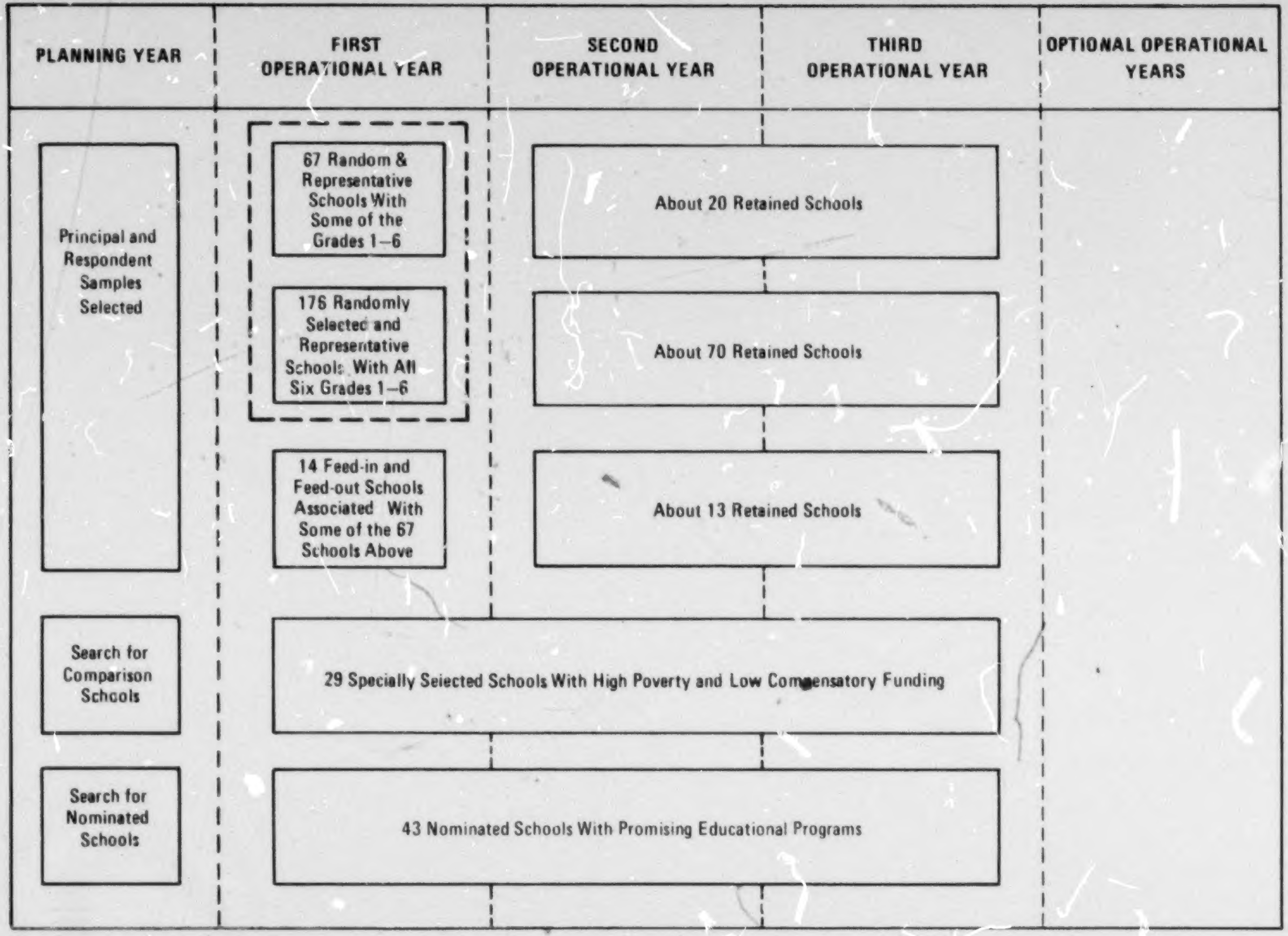
The schools participating in the descriptive studies are those from Groups A and B (randomly selected and nationally representative). The schools in all five groups participate in the analytic studies.

*The Second-Through-Fifth-Year Sample:* A sample composed of about 175 schools from all five groups. Those from Groups B, C, and D are specially selected for their characteristics in the analytic studies, and those from Groups A and E, with their feed-in or feed-out schools, are selected as representative of schools with homogeneous grade groupings.

Figure I-1 presents the various samples and groups over the first six years of this study.

---

*All numbers and analyses in this report are based upon the status of the various samples as of September 1, 1976 unless otherwise noted. Subsequent variations in the samples are not accounted for herein.


PLANNING YEAR
FIRST OPERATIONAL YEAR
SECOND OPERATIONAL YEAR
THIRD OPERATIONAL YEAR
OPTIONAL OPERATIONAL YEARS
Principal and Respondent Samples Selected
67 Random & Representative Schools With Some of the Grades 1–6
176 Randomly Selected and Representative Schools With All Six Grades 1–6
14 Feed-in and Feed-out Schools Associated With Some of the 67 Schools Above
About 20 Retained Schools
About 70 Retained Schools
About 13 Retained Schools
Search for Comparison Schools
29 Specially Selected Schools With High Poverty and Low Compensatory Funding
Search for Nominated Schools
43 Nominated Schools With Promising Educational Programs

The Participation Sample is surrounded by — — — — — —

Figure I-1
Samples During the First Four Years of the Sustaining Effects Study

# CHAPTER II. THE PRINCIPAL SAMPLE

The Principal Sample includes 5,035 schools representing the nation, with special attention to schools likely to receive compensatory-education funds. The schools had to be accessed through their respective Local Education Agencies (LEAs), which in most cases are school districts. The use of the LEA as an intermediate accessing unit is necessitated by the fact that one dimension of the stratification of the Principal Sample is the size of the LEA, and also by the fact that some demographic information (e.g., accurate poverty indexes) is at best available only down to the LEA level. The sampling procedure for the Principal Sample is, therefore, complicated by the fact that LEAs were categorized into appropriate sampling strata, but schools were selected into the sample, based only upon the sampling cell into which they were drawn by their LEAs.

The need for 5,035 schools for the Principal Sample was based upon the sampling design and upon expected attrition rates throughout the sampling period and during the study. When the sampling plan was developed, it was necessary to determine a number of schools that would ensure the representation of each classification (sampling cell) of schools in the final longitudinal sample. If the sample size at this initial phase were too small, artifactually empty cells might result. By working backward from the expected least-populated cell of the sampling matrix and multiplying the result by three, the number 5,035 was computed as the necessary size of the Principal Sample.

The need for the threefold oversampling was based upon the pessimistic estimate of 35 percent (non-response) reduction in the size of the Principal Sample and the possible exclusion or withdrawal of additional schools from the already reduced Respondent Sample and the various analytic samples. The sample size was set so that most of the sample cells would allow some selection in the final sampling phase and would afford some small set of replacement schools if they were needed.

## Selection of the Classification Data Tape

The data tape from which LEAs were selected was chosen from a number of available data tapes by means of a formalized evaluation. (Schools were sampled at the last stage of this phase by being drawn into their classification through their LEAs.) The evaluative criteria for selection from among the several national tapes are listed below.

1. *Comprehensiveness, Quality, and Accuracy of Data for Classification* – Is the LEA location information on the tape consistent with the geographic regions employed for sample selection? What index of LEA size is available from the tape? Number of students, number of schools, number of people served? What data are on the tape that will provide for the computation of a poverty index appropriate for classification purposes? How recent, appropriate, and accurate is it?

2. *Limitations in LEA Population* – What limitations are there in the data tape that will prevent subsequent sampling from the entire universe of schools (LEA size restrictions, inclusion of private schools, etc.)?

3. *LEA-School Linkage* – Are the school codes articulated or translatable with the LEA codes in some direct way? Is there a way to minimize non-isomorphism among the two possible data tapes?

4. *Limitations in School Population* – What limitations are there in the data tape that might prevent random sampling of schools within the LEAs (are small schools systematically excluded, etc.)?

5. *School Grade-Level Range Availability* – Is the school's grade-level range available so that schools not including any of grades 1 through 6 can be eliminated?

6. *Special School Code Availability* – Will the data tape allow direct culling for special schools, or will such information have to be obtained solely from the School Information Questionnaire?

7. *Age of Data* – How many years old are the data? How large an effect will the age have on the currency of any classification and subsequent sampling made from it?

8. *SDC Compatibility* – Is the data tape compatible with SDC computer systems? What are the data formats? How much programming would be needed to render it compatible?

9. *Cost and Time* – What is the cost of obtaining the data tape, per unit of needed information? How rapidly can it be obtained once it is selected?

The formal evaluations of the available Principal Sample data bases are presented in Table II-1. Based upon these evaluations, SDC selected a constellation of data bases that would provide maximum necessary and usable information for the selection of both LEA and school samples. The primary data base selected was the school and district tape provided by Market Data Retrieval (column 3 of Table II-1), hereafter called the "MDR Data Tape." Since this primary data base lacks the poverty information required for initial classification purposes, it was augmented by the Special Census Fourth-Count Tabulation (column 6 of Table II-1) and by the 1970 Census County Poverty Tabulation (column 7 of Table II-1). With the merging of the data from these three sources into one data base, the Principal Sample could be selected so as to be as exhaustive, current, cost-effective, and usable as possible. Based upon the information in the SDC-constructed data base, the LEAs were categorized according to the stratification dimensions.

**Stratification Dimensions**

The three stratification dimensions (geographic region, size of LEA, and poverty status of LEA), forming a three-dimensional factorial sampling design with 90 separate cells, were selected to ensure both national representativeness and a focus upon schools and students likely to receive compensatory-education funds or services.

*First Stratification: Geographic Region*

*Rationale.* The classification of LEAs (and subsequent sampling of schools) on the basis of geographic regions assures wide distribution of all program variations that are related to differences in region, such as background of students and teachers or type of program. In addi-

# Table II-1
## SDC Evaluation of Available Data Bases

| CRITERIA / DATA BASE NAME ORGANIZATION/ COMPANY | CIC CURRICULUM INFORMATION CENTER INC | MDR MARKET DATA RETRIEVAL | NCES NATIONAL CENTER FOR EDUCATIONAL STATISTICS | CENSUS SCHOOL DISTRICT FOURTH COUNT APPLIED URBANETICS NATIONAL CENTER FOR EDUCATIONAL STATISTICS | SPECIAL CENSUS FOURTH COUNT TABULATION NATIONAL CENTER FOR EDUCATIONAL STATISTICS |
|---|---|---|---|---|---|
| Geographic Location Information | State code<br>County code<br>District name, address & phone<br>School name, address & phone | Federal standard region<br>State code<br>County code<br>District name & address<br>School name & address | FIPS state code<br>County code & name<br>District name & address<br>School name & address | FIPS state code<br>County code & name<br>District name plus much census data | FIPS state code<br>County code & name<br>District name |
| LEA Size Information | District total enrollment | District total enrollment | District total enrollment | District total enrollment | District total enrollment |
| LEA Poverty Index | Not available | Not available | Not available | Orshansky population of children 5-17 | Orshansky children 5-17 |
| Limitations in LEA Population | Districts below 50 students combined into counties | No limitations | Districts below 300 not included | Districts below 300 not included | Districts below 300 not included |
| LEA School Link | Districts and schools in same file | Districts and schools in same file | Districts and schools on separate files | Districts only | Districts only |
| Limitations in School Population | No limitations other than districts | No limitations | No limitations | No school data | No school data |
| School Grade Level Range Availability | Available | Available | Available | Not available | Not available |
| Special School Code Availability | Special codes generally unsuitable | Special code generally suitable | Not available | Not available | Not available |
| Age (Year data collected) | 1975 | 1975 | 1972 (mostly) | 1970 | 1970 |
| SDC Compatibility Tape format (no. tracks, packing, label, no. reels) | Compatible 2 reels 800 BPI | Compatible 1 reel 1600 BPI | Compatible 1 reel 1600 BPI | Compatible 9 reels 1600 BPI | Compatible 2 reels including 1970 public school systems tape to match |
| Data Format (record size, blocking, fixed or variable length records) | Compatible | Compatible | Separate tapes must be matched merged | Requires district scripting & keypunching for poverty | Requires district scripting & keypunching for poverty |
| Cost and Time<br>A. Cost per unit of needed information<br>B. Delivery | $0.020<br>August 25 | $0.022<br>August 25 | $0.004<br>tapes on hand | $0.035<br>tapes on hand | $0.008<br>tape on hand |
| Comments | Lacks only name of school principal 63,320 Grade 1-6 schools, 14,440 districts, names of 6300-8000 Title I coordinators. Hard copy directory also available | Has names for superintendents and principals 61,387 Grade 1-6 schools, 15,406 districts. Names for federal project coordinators rather than Title I coordinator | 3 years out of date at best 10% of schools are 4 years out of date | Analysis of California districts showed discrepancies | Child counts are inaccurate in big cities and Ohio. Seven states not on this tape. Poverty ratios appear to be more accurate than counts |

| 1970 CENSUS COUNTY POVERTY TABULATION NATIONAL CENTER FOR EDUCATIONAL STATISTICS | IRS INCOME DATA INTERNAL REVENUE SERVICE | OCR SCHOOL SAMPLE OFFICE OF CIVIL RIGHTS U.S. OFFICE OF EDUCATION | COLEMAN SCHOOL PUPIL DATA BASE NATIONAL CENTER FOR EDUCATIONAL STATISTICS | CONSOLIDATED PROGRAM INFORMATION REPORT NATIONAL CENTER FOR EDUCATIONAL STATISTICS | MERGED SCHOOL DISTRICT FOURTH COUNT NATIONAL CENTER FOR EDUCATIONAL STATISTICS | SCHOOL DISTRICT FIRST COUNT NATIONAL CENTER FOR EDUCATIONAL STATISTICS |
|---|---|---|---|---|---|---|
| FIPS state code<br>County code & name | ZIP code | FIPS state code<br>County code & name & address<br>District name<br>School name | FIPS state code<br>County code & name<br>School name & address | FIPS state code<br>County code & name<br>District name & address | FIPS state code<br>County code & name<br>District name & address | FIPS state code<br>County code & name<br>District name plus census data |
| None | None | District total enrollment | Used county instead of district as primary sampling unit | District total enrollment | District total enrollment | District total enrollment |
| Orshansky children 5-17 | Would require estimating procedure based on income | Not available | Not available | Not available | Orshansky population or children 5-17 | Orshansky population or children 5-17 |
| Districts must be extrapolated from counties | LEA poverty ratio is extrapolated from medium incomes | Sample of 8,000 districts 60% of universe | School data only | 1,000 districts receiving Federal aid only | 4,900 districts and their schools | Districts below 300 not included |
| Not available | Not available | Districts and schools in same file | Schools only | Districts only | Districts and schools in same file | Districts only |
| No school data | No school data | By racial/ethnic composition only | 4,000 schools and 525,000 pupils presampled | No school data | Fractional school data | No school data |
| Not available | Not available | Available | Available | Not available | Available | Not available |
| Not available | Not available | Not available | Not available | Not available | Not available | Not available |
| 1970 | Availability of 1970 matching tape unknown | 1972 | 1965 | 1971 | 1970 | 1970 |
| Listing is available | Compatibility and complexity of this tape is unknown | 1 reel | 34 reels | 1 reel | 1 reel | 9 reels |
| Requires district scripting & keypunching for poverty | Requires analysis, district scripting & keypunching for poverty | Many data inconsistencies isolated by SDC | Costly to clean & reorganize | Requires school match up | Incomplete data set | Requires district scripting & keypunching for poverty |
| $0.000<br>listing is on hand<br>must be keypunched | [illegible]<br>tape on hand<br>quality is unknown | $0.000<br>tape on hand | $0.132<br>not ordered | $0.016<br>not ordered | $0.002<br>not ordered | $0.035<br>not ordered |
| Has seven states with coterminous county & district boundaries<br>Also can use for extrapolating district from county when necessary | Requires ZIP to LEA conversion | Not recommended, deleted from survey | Inappropriate, deleted from survey | Not recommended, deleted from survey | Not recommended, deleted from survey | Inferior to 4th count<br>Not recommended, deleted from survey |

tion, national representation is assured through such stratification, as well as the inclusion of many different political and educational variations. Regional representation also contributes to the acceptability of findings and bolsters confidence in their applicability.

*Procedure.* The geographic strata were defined by the ten Standard Federal Regions (U.S. Government Manual, 1974) utilized by the Federal Government for administrative operations. The ten regions (strata) and the states comprising each (omitting outlying island possessions) are listed in Table II-2, along with a descriptive name for each stratum. Figure II-1 presents the ten regions on a map.

Table II-2

The Ten Standard Federal Regions, Their Constituent States, and Descriptive Names

| Standard Federal Regions | Constituent States (and District) | Descriptive Names |
|---|---|---|
| I | Connecticut, Massachusetts, Maine, New Hampshire, Rhode Island, Vermont | New England |
| II | New Jersey, New York | Metropolitan Northeast |
| III | Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia | Mid-Atlantic |
| IV | Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee | Southeast |
| V | Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin | North Midwest |
| VI | Arkansas, Louisiana, New Mexico, Oklahoma, Texas | South Central |
| VII | Iowa, Kansas, Missouri, Nebraska | Central Midwest |
| VIII | Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming | North Central |
| IX | Arizona, California, Hawaii, Nevada | Pacific Southwest |
| X | Alaska, Idaho, Oregon, Washington | Pacific Northwest |

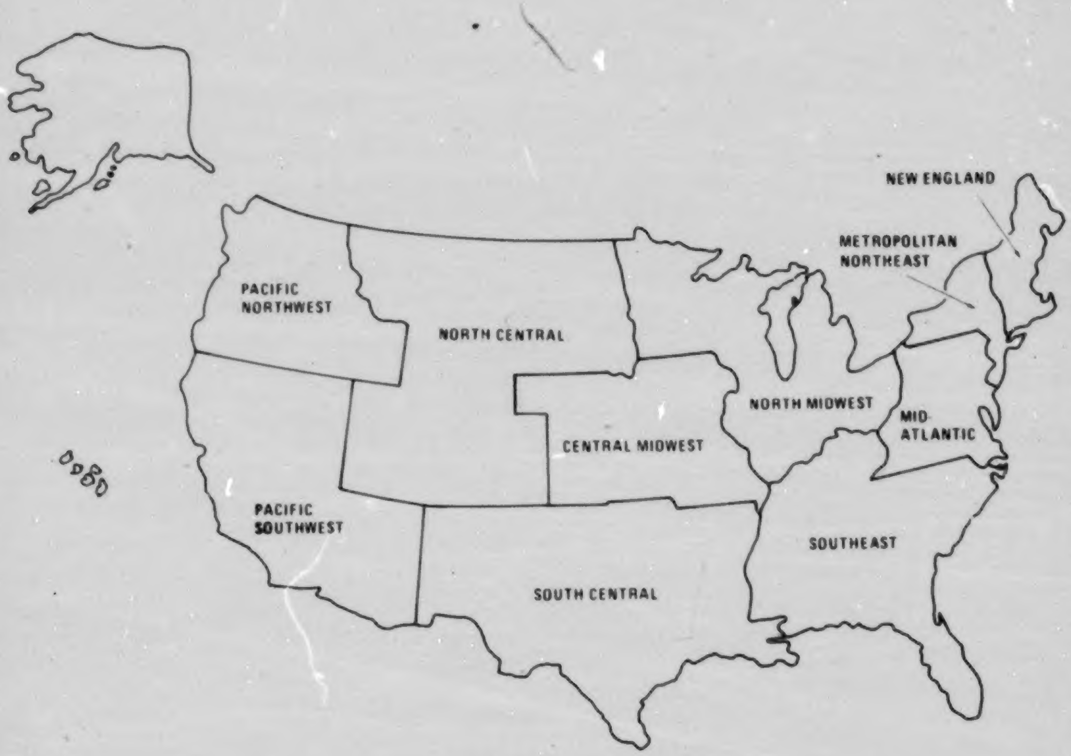


Figure II-1
Ten Geographic Strata of the Principal Sample

Table II-3 presents the ten regions, the number of children associated with LEAs in each region, and the percentage of the nation's children that are associated with each region, based upon 1975 state enrollment data published by the Curriculum Information Center, Inc. (1975).

Each LEA and its associated schools included in the data base was assigned to its respective Standard Federal Region on the basis of its state code on the MDR Data Tape.

## Table II-3

## Numbers and National Percentages of Children, Aged 5 Through 17, Associated With LEAs in Each of the Ten Standard Federal Regions

| Standard Federal Regions | Number of Children Associated With LEAs in the Region | Percentage of the Nation's Children Associated With LEAs in the Region |
|---|---|---|
| I – New England | 2,550,491 | 5.71 |
| II – Metropolitan Northeast | 4,881,514 | 10.93 |
| III – Mid-Atlantic | 4,985,057 | 11.16 |
| IV – Southwest | 7,165,493 | 16.04 |
| V – North Midwest | 9,587,533 | 21.47 |
| VI – South Central | 4,872,954 | 10.91 |
| VII – Central Midwest | 2,406,015 | 5.39 |
| VIII – North Central | 1,424,109 | 3.19 |
| IX – Pacific Southwest | 5,273,937 | 11.81 |
| X – Pacific Northwest | 1,514,497 | 3.39 |
| TOTAL | 44,661,600 | 100.00 |

*Second Stratification: Size of LEA*

*Rationale.* Assurance that the schools in the sample encompass a wide range of LEA sizes accomplishes two desirable objectives for the sampling plan. First, both descriptive and analytic studies require schools located in the complete range of urban-suburban-rural areas, so that differences caused by or associated with population density will be represented in the sample.

Second, in some of the analytic studies, the organizational structure of the educational system in which children receive their educations is hypothesized to be related to the children's educational progress. We expected that a wide range of LEAs, according to their sizes, would provide a wide range of organizational structures of LEAs.

*Procedure.* All the LEAs from the MDR Data Tape were ordered according to the number of students they serve (Average Daily Attendance, or ADA). The list of ordered LEAs was then divided into three parts so that each part contained an equal number of students, but an unequal number of LEAs: all LEAs in the third stratum are larger than any in the second, all LEAs in the second are larger than any in the first. Each stratum from one to three has fewer LEAs, but approximately the same number of students.

## CAN LEA AVERAGE DAILY ATTENDANCE BE SUBSTITUTED FOR URBAN-SUBURBAN-RURAL STATUS?

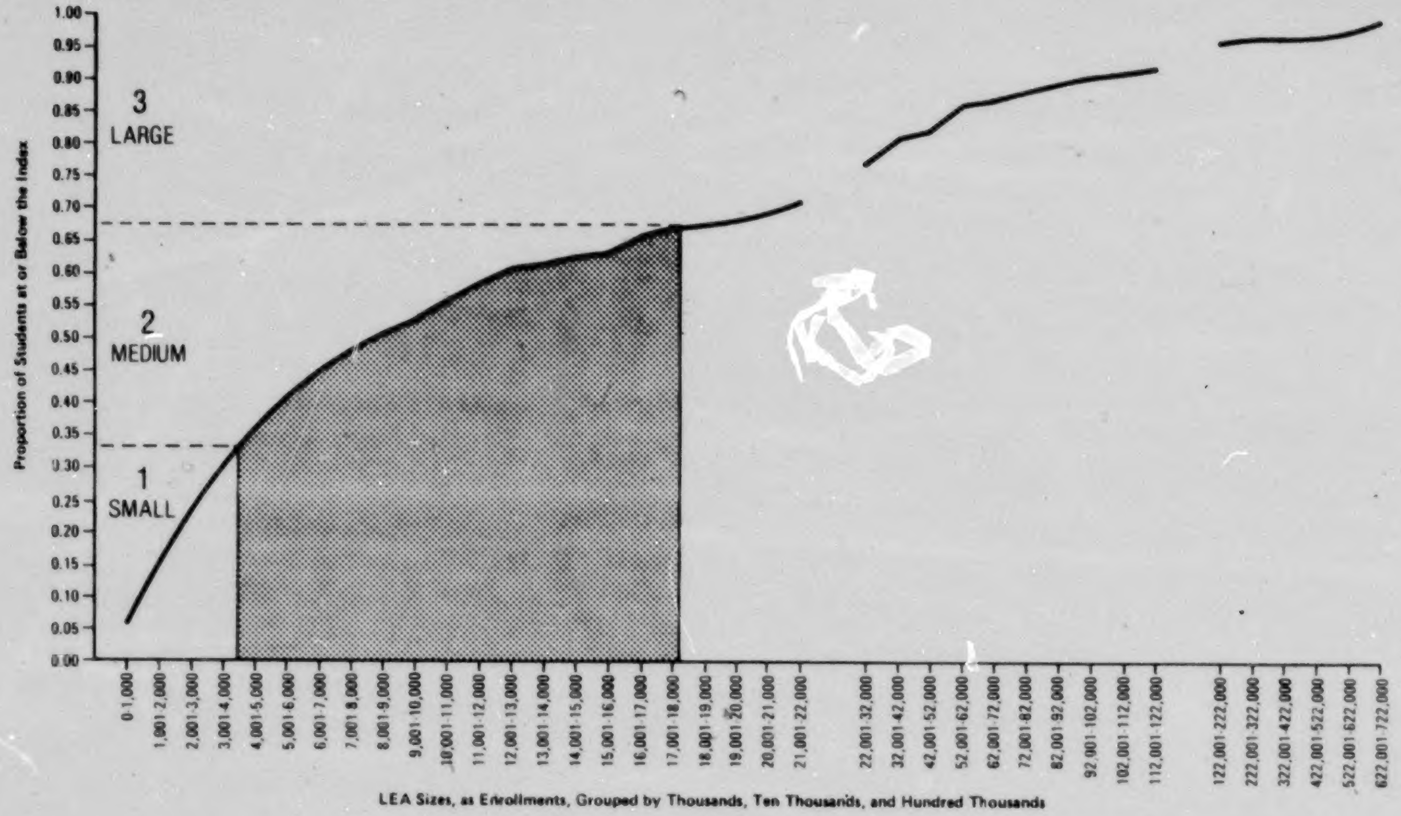
In a small study employing unweighted data from the seven states whose county boundaries are coterminous with LEA boundaries, the correlation between LEA size and percentage of urbanism (based upon 1970 census data for counties) was found to be +.63; the correlation with county population was +.53; and the correlation with proportion of county area devoted to farms was −.15. These correlation coefficients are all underestimates of the true relationships, because the seven states (District of Columbia, Florida, Hawaii, Maryland, Nevada, Virginia, and West Virginia) are not representative of the variations of the nation, but tend to be characterized by extreme values (lower percentages of urbanized population, higher population density, and lower percentage of farm area). National parameters were not available, unfortunately, to adjust the correlation coefficients for the attenuation of the distributions of the variables. The multiple correlation of the three aspects of the urban-suburban-rural dimension in prediction of LEA size was found to be +.71, indicating that LEA size will serve well as a surrogate for the dimension. (For a discussion of the relationship of LEA size to population density and to racial-ethnic composition and school and district integration, see also: Coleman, J. S., 1975, pp.3-12). The need for a surrogate arises from the fact that the available data bases do not provide information relating LEAs directly to some commonly employed dimension of population density.

Each LEA (and its associated schools) in the data base was assigned to its respective size stratum in the process of dividing the LEA-size dimension into its three parts. Where large districts have been subdivided into area districts and the area district ADAs were provided on the MDR Data Tape (e.g., New York City, Chicago, Los Angeles), the area-district ADAs were replaced by total-district ADAs to better reflect the urban nature of each area.

Table II-4 presents the number of LEAs in each stratum, the number of students in each stratum, and the percentage of all students in the data base in each stratum. Figure II-2 presents the grouped frequency distribution of LEA sizes by numbers of students and by the three strata. A tabulation of number of districts by enrollment size is provided by the National Center for Educational Statistics (1977).

Table II-4
The Number of LEAs in Each LEA-Size Stratum, the Number of Students in Each Stratum, and the Percentage of All Students in the Data Base in Each Stratum

| LEA Size Stratum | Number of LEAs | Number of Students | Percent of Students |
|---|---|---|---|
| 1. Small (1-4,535) | 13,200 | 15,049,111 | 33.3383 |
| 2. Medium (4,536-18,229) | 1,832 | 15,036,135 | 33.3095 |
| 3. Large (18,230-21,043) | 344 | 15,055,396 | 33.3522 |
| TOTAL | 15,376 | 45,140,642 | 100.0000 |



NOTE – Although New York City's 42 district areas are reflected above as separate districts with enrollments ranging from 630 to 91,279, they were all coded into LEA-size stratum 3 for sampling purposes.

Figure II-2
Grouped Cumulative Frequency Distribution of LEAs by Size
(Number of Students Enrolled) and by the Three Strata

*Third Stratification: Poverty Status of LEA*

*Rationale.* The introduction of this stratification dimension into the sampling plan was to ensure appropriate representation of LEAs and their schools that in various ways meet different economic requirements associated with the receipt of Title I and other compensatory-education funds. The Participation Study, further, will describe economically disadvantaged students who do and do not receive compensatory-education services. These students must be included in the analytic samples in sufficient numbers to support the detailed descriptive analyses.

It should be noted that inclusion of this dimension of stratification at this stage of the sampling plan provides for, but does not guarantee, the desired representation of various poverty-level students in the final analytic sample. The selection of a predetermined number of LEAs does not ensure the selection of schools within the LEA or of students within the schools. Provision for a wide range of LEAs at the various poverty-level strata will, however, have a direct and strong influence on the selection of schools and students. The assumption that it is more likely that LEAs with high poverty will have schools with low poverty than that LEAs with low poverty will have schools with high poverty (a probability suggested by the politics of drawing LEA boundaries) reinforced the original intention to oversample among poverty LEAs. (To ensure exact representation of schools with a given poverty status, it would be necessary to stratify within LEAs and develop selection criteria for schools within each selected LEA. To ensure exact representation of students with a given poverty status, it would be necessary additionally to stratify within schools and then develop selection criteria for students within schools within LEAs. Neither of these approaches was elected because no systematic national data base has uniform poverty information for schools or students).

*Procedure.* For each LEA, an index of poverty status was computed (the ratio of the number of children aged 5-17 in families below the 1970 poverty level to the total number of children aged 5-17 associated with the LEA), except as noted below. The numerator of this ratio is the LEA information used by Chief State School Officers in the allocation of Title I funds to their constituent LEAs. The obtained ratio, multiplied by one thousand to indicate the number of "poor" children per thousand, was then placed on a frequency distribution; the distribution was then divided unequally into the following three groups: the poorest 20 percent of the distribution, the next higher 30 percent, and the least poor 50 percent of the distribution. The unequal division puts greater proportional emphasis on the lower-income LEAs and schools by focusing as much attention on the most disadvantaged (the poorest 20 percent) as on the other groups. This ensures inclusion of schools that qualify for compensatory funds, by a method that is efficient and that maintains the essential randomness within the sample.

Table II-5 presents the numbers of LEAs, schools, and students in each stratum. Figure II-3 presents the frequency distribution of poverty indexes and the points of division into groups.

Table II-5

The Number of LEAs in Each Poverty-Level Stratum, the Number of Students in Each Stratum, and the Percentage of All Students in the Data Base in Each Stratum

| LEA Poverty Stratum | Number of LEAs | Number of Students | Percent of Students |
|---|---|---|---|
| 1. High Poverty (220-881 per 1,000) | 3,811 | 9,050,554 | 20.0497 |
| 2. Moderate Poverty (119-219 per 1,000) | 4,373 | 13,480,904 | 29.8642 |
| 3. Medium-to-Low Poverty (2-118 per 1,000) | 7,192 | 22,609,184 | 50.0861 |
| TOTAL | 15,376 | 45,140,642 | 100.0000 |

### Selection of the Principal Sample

The total population of LEAs and their constituent schools having at least one of the grades 1 through 6 was then apportioned, according to their natural incidence, to the 90 cells established by the three stratification dimensions. The stratification dimensions and the resulting 90 cells are displayed as a three-dimensional matrix in Figure II-4. The sample drawn from this sampling matrix can be unbiased, and can serve very well to provide national projections for the descriptive Participation Study. The sample presents the analytic longitudinal studies with problems in logistics, however. The tracking of students for the years of this study is simplified if the students transfer to new schools only once at the intermediate, middle, or junior-high levels. The tracking is more complicated if they transfer to new schools more than once.

It is for these reasons that the Principal Sample and the samples derived from it are considered to be composed of two groups, A and B. Group B is limited to only those schools with all six of the grades 1-6 (66.85 percent of all schools with any grades in the 1-6 range) and is therefore ideally suited to longitudinal study. Group A schools have at least one grade, but not all six, in the 1-6 range (33.15 percent of all schools with any grades in the 1-6 range). The combination of Groups A and B serves as the sample for the Participation Study. In addition, Group B will form the base of the analytic studies and will be augmented by specially selected comparison schools.

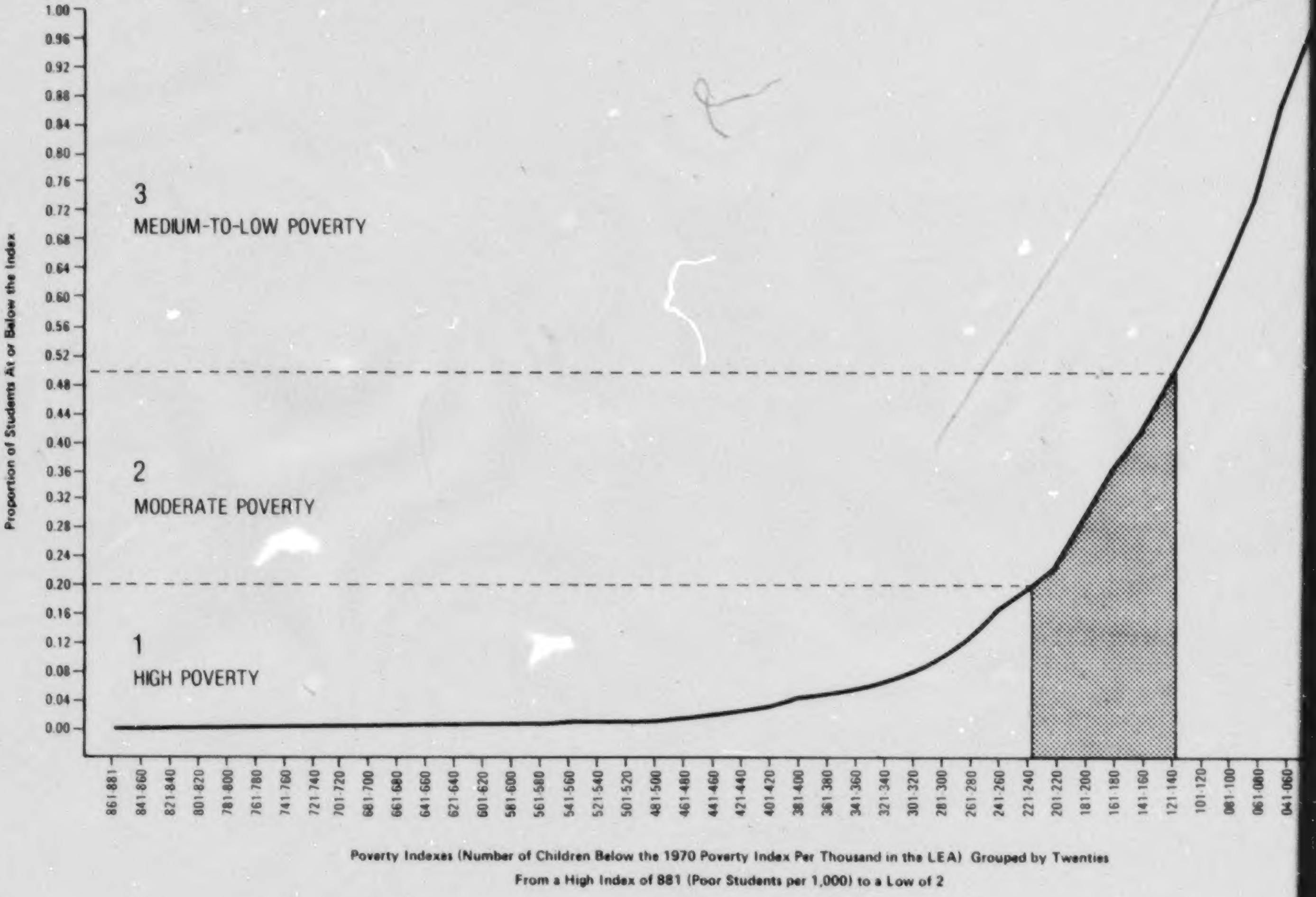


Figure II-3
Grouped Cumulative Frequency Distribution of Students by Their
LEA Poverty Indexes and the Points of Stratification

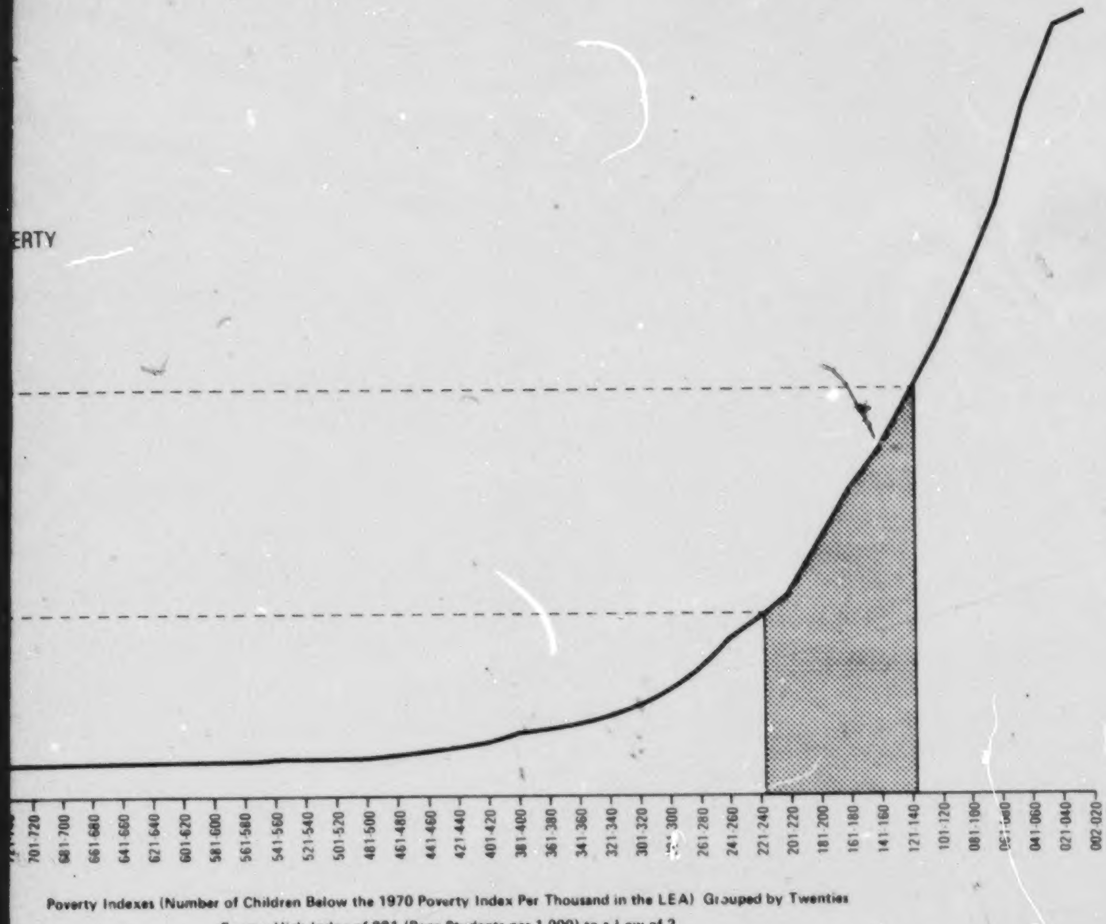


Figure II-3
Grouped Cumulative Frequency Distribution of Students by Their LEA Poverty Indexes and the Points of Stratification

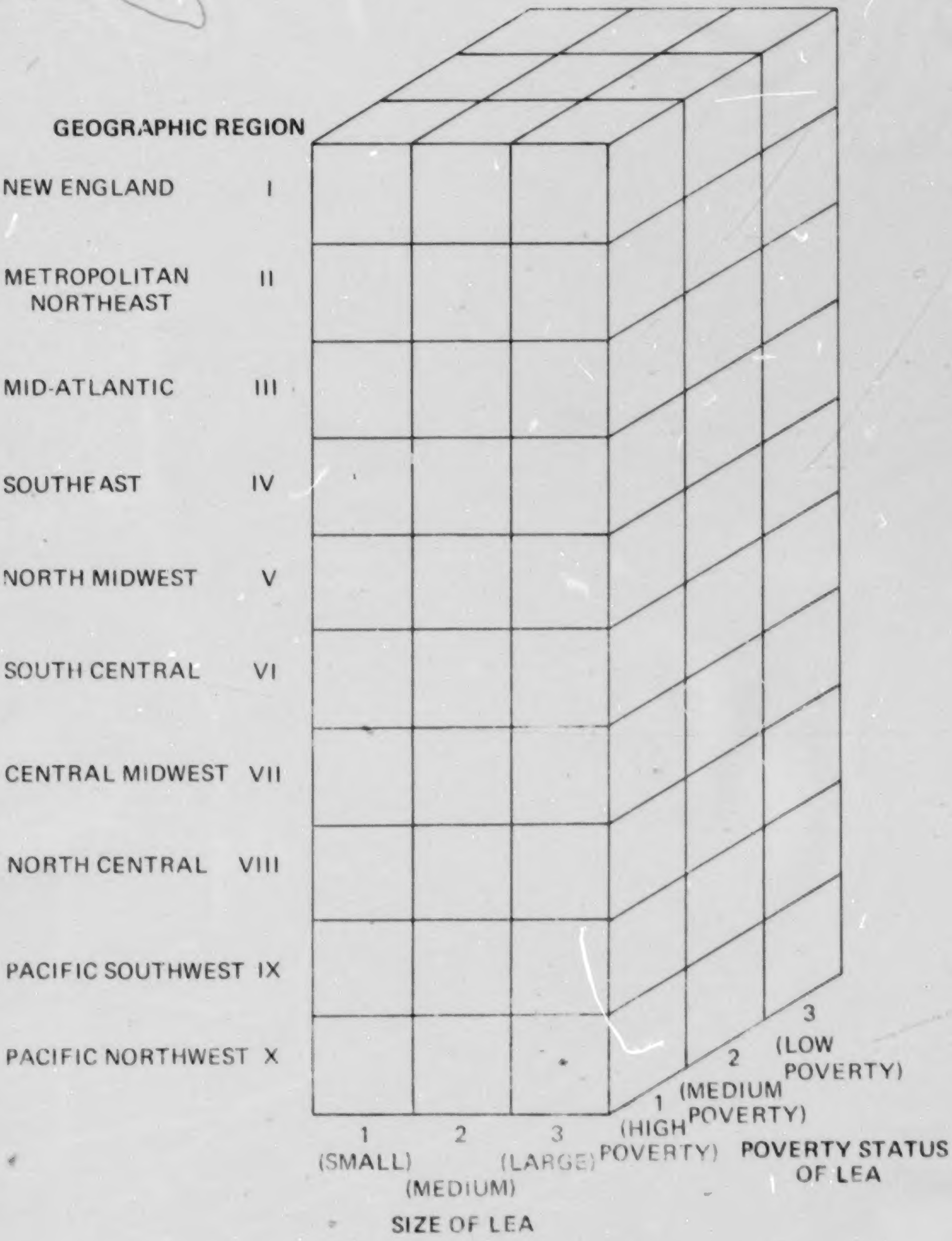


Figure II-4. Three-Dimensional Sampling Matrix

## HOW WERE POVERTY INDEXES OBTAINED FOR THE LEAs?

The basic source of such poverty information was a special tabulation of the 1970 Census data made by NCES for Title I allocation purposes. This tabulation apportions poverty census counts from enumeration districts to LEAs (school districts) based upon assumptions concerning census accuracy for poor persons, income sampling accuracy, and the residential homogeneity of enumeration districts. (For a more detailed description of this process, see Canyon Research Group, 1975.)

In this effort all districts with fewer than 300 students were excluded from the original counts, except for the states of New York, Illinois, and Kansas, from which all districts were included. LEAs in states with a large proportion of small districts, such as Montana, Wyoming, Arizona, and Utah, therefore, do not appear in the tabulation described above. Also omitted are LEAs that are coterminous with counties (in the District of Columbia, Florida, Hawaii, Maryland, Nevada, Virginia, and West Virginia). Because of this exclusion policy, it was necessary to assign poverty indexes most nearly appropriate for the excluded LEAs. A special county poverty tape provided by NCES was used to obtain poverty indexes for those LEAs coterminous with counties. Each remaining LEA without a poverty index was assigned an index corresponding to the average of those LEAs in the same or near ZIP-code vicinity. This strategy was based upon the assumption that an LEA's poverty rate is more like that of neighboring LEAs than it is like the entire county in which it is located.

A summary of the sequentially relaxed linkage processes appears below.

| Linkage Procedure with MDR Data Tape | Number of LEAs Linked to Poverty Indexes |
|---|---|
| Exact linkage with NCES Title I poverty tape on five-digit ZIP-code, first three letters of LEA name, and grade span | 10,204 |
| Relaxed linkage with NCES Title I poverty tape by eliminating upper grade of grade span | 239 |
| Relaxed linkage with NCES Title I poverty tape by eliminating last two digits of ZIP-code, plus upper grade span | 983 |
| Relaxed linkage with NCES Title I poverty tape by eliminating exact spelling, last two digits of ZIP-code, and upper grade span | 276 |
| Exact linkage with 1970 Census Fourth Count School District tape on FIPS state number, FIPS county number, and OE district number | 705 |
| Manual linkages based upon average of same or near ZIP-code poverty indexes | 2,969 |
| TOTAL Number of Linkages | 15,376 |

## HOW DID SCHOOLS REPLACE THEIR LEAs?

After each LEA on the MDR district tape was linked to a poverty index, it was sorted into one of the 90 cells of the sampling matrix and was assigned a three-digit code to identify its cell assignment. Accompanying the MDR district tape was an articulated school universe tape containing data for 87,993 schools. This tape was filtered, analyzed, and corrected to a universe consisting of 62,534 schools for each of which the appropriate three-digit sampling-matrix code was attached.

The schools removed from the 87,993-school universe included 23,820 schools without any grades 1-through-6 (the bulk of them being secondary schools). An additional 1,367 schools were removed as special schools, and 272 schools were removed because they could not be matched to district records, and therefore could not be assigned into the sampling matrix (most of the unmatchable schools appeared to be special county and state schools, and would have been removed from the sample anyway). The net result of these removals from the universe was a reduced universe of 62,534 schools, which were classified into the 90 cells of the sampling matrix for sampling purposes.

*Selection of Schools from Geographic-Region Strata.* The schools associated with LEAs were selected from their respective regions (full horizontal slabs in Figure II-4) in numbers proportional to the number of children aged 5 through 17 (the age range of Title I students) residing in those regions and associated with an LEA in the data base. This selection procedure resulted in a sample of schools proportionally representative of the nation's geographic regions.

*Selection of Schools from LEA-Size Strata.* The schools associated with LEAs were selected from their respective LEA-size strata (full vertical slabs, front-to-back, in Figure II-4) so that the number of students in each size stratum is approximately equal. This selection procedure resulted in a sample of schools disproportionally representative of the nation's LEA size range. This disproportionality according to LEA size assures more nearly equiprobable selection of the nation's students, for the following reason: If schools were selected in equal numbers disregarding their associated LEA size, then the great number of small LEAs with small schools would dominate the sample because of their numbers, while the (generally larger) schools associated with large LEAs, which are relatively fewer in number, would play a very minor role in the sample. Such a sampling plan would clearly under-represent the larger urban areas, where many of the compensatory-education programs are located.

*Selection of Schools from Poverty-Status Strata.* The schools associated with LEAs were selected from their respective strata (full vertical slabs left-to-right in Figure II-4) so that the number of students drawn from each poverty stratum is approximately equal. The selection of one-third of the schools from each of the unequal poverty-level strata (the lowest being very poor, the next containing many poor, and even the highest having some poor) weighted the sample, in a manner that maintains its essential randomness, to favor LEAs (and schools) with families below the poverty level. This approach was designed to ensure the inclusion of LEAs, schools, and thus students, that meet the varied economic requirements for receipt of compensatory-education funds.

## Sampling Procedure

The number of schools to be sampled from each cell was determined (based upon census-region proportions, LEA-size equalities, and poverty-level proportions) so that the total number of schools selected into the Principal Sample was 5,035. Preliminary estimates based upon various sources of information, and rough projections based upon the assumption of no correlation between or among strata, indicated that cell populations in a 5,000-school Principal Sample could be expected to vary from a low of 21 schools in a North Central cell to a high of 95 schools in a North Midwest cell. The sample size of about 5,000 was set to provide about three times the number of schools finally needed (three to be selected and four as replacements) in the smallest of the cells. This initial oversampling by a factor of three was considered necessary to overcome the various forces of sample attrition to be discussed below.

The procedures for sampling, based upon the desired goal of approximately equiprobable sampling of students within disproportionate strata, are as follows:

1. Determine the number of **students** in schools (prorated for grades 1 through 6, or fractions thereof) with any or all grades one through six associated with the LEAs in each of the 90 cells.

2. Determine the number of **schools** with any or all grades one through six associated with the LEAs in each of the nine primary sampling columns. Each primary sampling column is composed of cells for the ten geographic regions of the same LEA size and the same poverty status (a column of Figure II-4).

3. Determine the sampling rate for **schools** for each primary sampling cell that will result in about 555 schools (5,000 divided by 9) for that primary sampling cell (e.g., if the total number of qualifying schools in the primary sampling cell is 6,000, the sampling rate is 9.25 percent for that primary sampling cell).

4. Multiply the number of **students** in each cell by the sampling rate for its primary sampling cell. The quotient is the target number of **students** per cell.

5. Within each cell, randomly order the **schools** from the data base.

6. Select the number of **schools** that will provide the target number of **students** in each cell. If, for example, the target number of students is x, and selection of the first y randomly-ordered schools provides the cell with x-n students, while the first y+1 schools provides x+m students, then the number of schools selected for that cell is determined by which is smaller, n or m. If n is smaller, then y schools are selected; if m is smaller than or equal to n, then y+1 schools are selected. This procedure provided an average of about 555 schools per primary sampling cell, and a total sample of about 5,000 schools. (The actual sample was composed of 5,035 schools.)

The number of schools from the data base in each cell and the percentage of the total number of schools in the data base for each of the 90 cells is presented in Table II-6.

## Table II-6

### The Number and the Proportion of Qualifying Schools (At Least One Grade in the 1-6 Range) for Each of the 90 Cells of the Sampling Matrix

| Cell* | No. | Prop. | Cell* | No. | Prop. | Cell* | No. | Prop. |
|---|---|---|---|---|---|---|---|---|
| 011 | 149 | .0024 | 321 | 2,205 | .0353 | 631 | 140 | .0022 |
| 012 | 514 | .0082 | 322 | 1,136 | .0182 | 632 | 240 | .0038 |
| 013 | 1,722 | .0275 | 323 | 196 | .0031 | 633 | 365 | .0058 |
| 021 | 0 | .0000 | 331 | 1,095 | .0175 | 711 | 622 | .0099 |
| 022 | 283 | .0045 | 332 | 1,524 | .0244 | 712 | 917 | .0147 |
| 023 | 1,369 | .0219 | 333 | 423 | .0068 | 713 | 667 | .0107 |
| 031 | 101 | .0016 | 411 | 436 | .0070 | 721 | 0 | .0000 |
| 032 | 194 | .0031 | 412 | 1,724 | .0276 | 722 | 140 | .0022 |
| 033 | 113 | .0018 | 413 | 5,122 | .0819 | 723 | 374 | .0060 |
| 111 | 33 | .0005 | 421 | 38 | .0006 | 731 | 0 | .0000 |
| 112 | 354 | .0057 | 422 | 263 | .0042 | 732 | 195 | .0031 |
| 113 | 1,884 | .0301 | 423 | 3,379 | .0540 | 733 | 340 | .0054 |
| 121 | 36 | .0006 | 431 | 32 | .0005 | 811 | 435 | .0070 |
| 122 | 255 | .0041 | 432 | 1,679 | .0268 | 812 | 650 | .0104 |
| 123 | 1,517 | .0243 | 433 | 1,025 | .0164 | 813 | 833 | .0133 |
| 131 | 603 | .0096 | 511 | 2,171 | .0347 | 821 | 109 | .0017 |
| 132 | 213 | .0034 | 512 | 812 | .0130 | 822 | 628 | .0100 |
| 133 | 307 | .0049 | 513 | 409 | .0065 | 823 | 1,388 | .0222 |
| 211 | 364 | .0058 | 521 | 920 | .0147 | 831 | 116 | .0019 |
| 212 | 580 | .0093 | 522 | 372 | .0060 | 832 | 1,111 | .0178 |
| 213 | 1,085 | .0174 | 523 | 334 | .0053 | 833 | 903 | .0144 |
| 221 | 673 | .0108 | 531 | 504 | .0081 | 911 | 96 | .0015 |
| 222 | 823 | .0132 | 532 | 1,133 | .0181 | 912 | 625 | .0100 |
| 223 | 1,172 | .0187 | 533 | 288 | .0046 | 913 | 737 | .0118 |
| 231 | 398 | .0064 | 611 | 448 | .0072 | 921 | 0 | .0000 |
| 232 | 574 | .0092 | 612 | 1,183 | .0189 | 922 | 100 | .0016 |
| 233 | 941 | .0151 | 613 | 1,352 | .0216 | 923 | 579 | .0093 |
| 311 | 2,038 | .0326 | 621 | 28 | .0004 | 931 | 0 | .0000 |
| 312 | 438 | .0070 | 622 | 69 | .0011 | 932 | 0 | .0000 |
| 313 | 53 | .0009 | 623 | 632 | .0101 | 933 | 506 | .0081 |

*Cell code is as follows: First number is geographic region minus 1 (to keep the code to a single digit); second is LEA size, last number is LEA poverty index. Numbers are from Figure II-4.

## WHICH STATES ARE REPRESENTED IN THE PRINCIPAL SAMPLE?

All fifty states and the District of Columbia are represented in the Principal Sample. Each state is listed below, followed by a pair of numbers. The first number is the percentage of schools in the nation from that state with at least one grade in the 1-6 range; the second number is the percentage of such schools in the Principal Sample.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| AL | 1.22 | 2.18 | KY | 1.69 | 2.59 | ND | 0.58 | 0.64 |
| AK | 0.40 | 0.26 | LA | 1.42 | 3.54 | OH | 4.94 | 3.73 |
| AZ | 0.95 | 0.77 | ME | 1.09 | 1.11 | OK | 1.87 | 1.83 |
| AR | 1.15 | 1.41 | MD | 1.60 | 2.34 | OR | 1.47 | 1.57 |
| CA | 8.59 | 8.54 | MA | 3.13 | 2.48 | PA | 5.12 | 3.71 |
| CO | 1.38 | 1.63 | MI | 4.66 | 2.88 | RI | 0.48 | 0.36 |
| CT | 1.45 | 1.17 | MN | 1.91 | 1.49 | SC | 1.32 | 2.09 |
| DE | 0.24 | 0.34 | MS | 0.73 | 0.97 | SD | 1.09 | 0.93 |
| DC | 0.22 | 0.52 | MO | 2.49 | 2.14 | TN | 1.99 | 2.98 |
| FL | 2.26 | 2.70 | MT | 0.99 | 0.95 | TX | 5.79 | 5.80 |
| GA | 2.15 | 3.71 | NE | 1.19 | 0.71 | UT | 0.60 | 0.68 |
| HI | 0.25 | 0.33 | NV | 0.57 | 0.26 | VT | 0.55 | 0.44 |
| ID | 0.56 | 0.46 | NH | 0.57 | 0.16 | VA | 2.09 | 3.02 |
| IL | 5.66 | 4.29 | NJ | 3.12 | 2.26 | WA | 1.80 | 1.27 |
| IN | 2.50 | 2.11 | NM | 0.70 | 0.97 | WV | 1.48 | 1.81 |
| IA | 1.96 | 1.29 | NY | 5.18 | 5.22 | WI | 2.70 | 1.91 |
| KS | 1.80 | 1.79 | NC | 2.26 | 3.43 | WY | 0.41 | 0.22 |

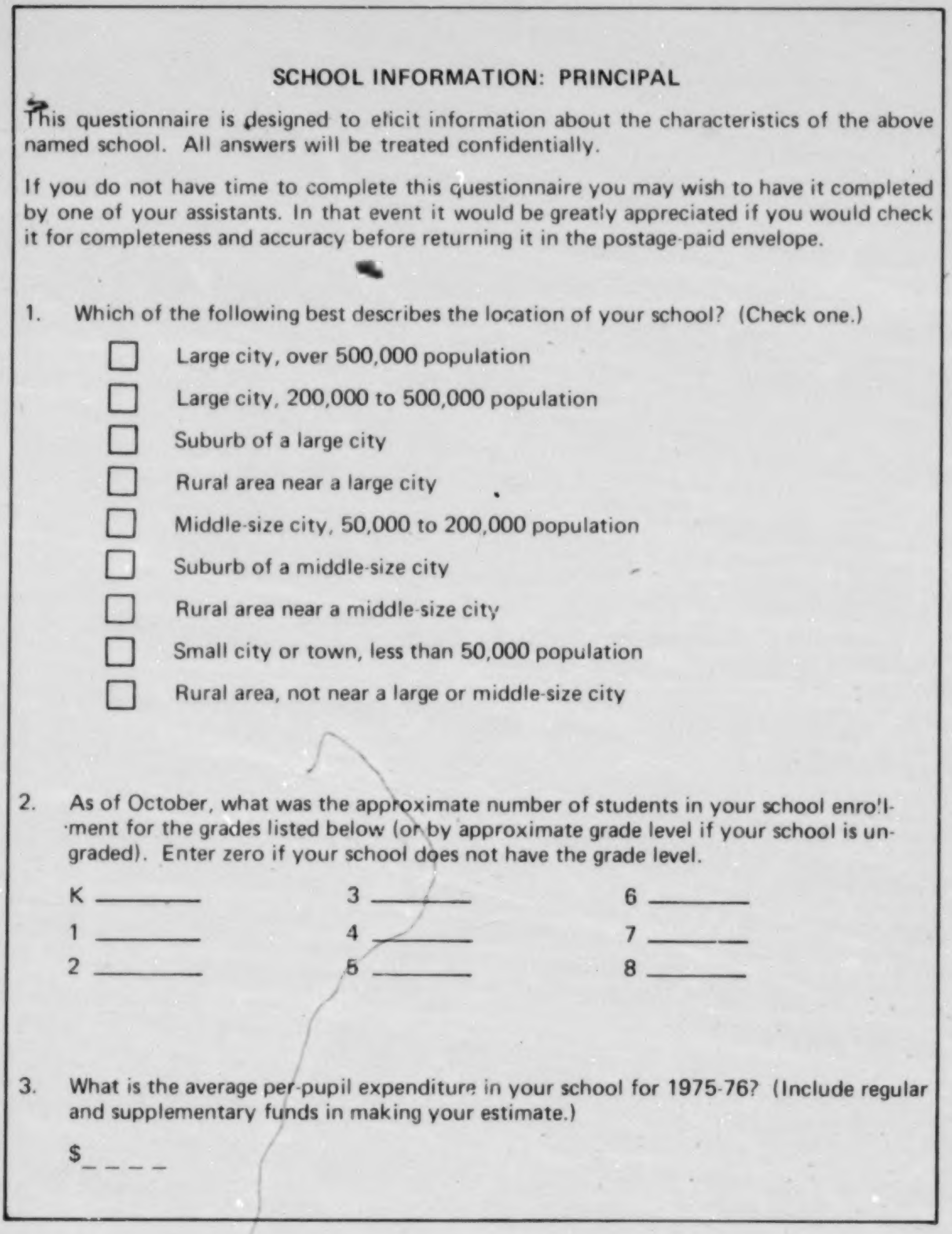
Exact representation of each state is not expected because two of the dimensions of the sampling matrix, size of LEA and poverty level, are not naturally evenly distributed across all states. It follows from the sampling plan that states with many poverty districts are likely to be over-represented, while those with few poverty districts are likely to be under-represented. Later, of course, such discrepancies will be weighted back to national student representativeness.

# CHAPTER III. THE RESPONDENT SAMPLE

The Principal Sample of 5,035 schools contains schools selected in the three-stage procedure outlined above. The School Information Questionnaire (see Figure III-1) was sent to the principal of each school in this sample, the District School Information Questionnaire was sent to the superintendent of the LEA associated with each sampled school, and a letter was sent to each LEA's Title I coordinator or equivalent, explaining SDC's study and the procedure for selecting schools into the sample. The schools that responded to this survey constituted the Respondent Sample.

*The School Information Questionnaire.* In addition to introducing the evaluation study and informing the principals of the value of its findings, the questionnaire for principals obtained selected information about the school that was to be used for monitoring the sample to account for some of the characteristics of the non-respondents, selecting other special subsamples (e.g., summer-school study sample), and alerting us to the need for certain types of comparison schools that are not adequately represented for later analytic studies. The questions asked, in addition to a request for the name and telephone number of the Principal's appointed contact person, focused upon such issues as:

- Precise description of the location of the school in terms of the urban-suburban-rural dimension;
- Current number of students in the school, by grade level;
- Average per-pupil expenditure, including regular and supplementary funds;
- Racial/ethnic composition of the student body;
- Estimate of the percentage of educationally disadvantaged students in the school;
- Estimate of the percentage of students in the school who meet certain poverty criteria;
- Sources of funds supporting compensatory services in the school;
- Indication of whether most of the instruction in the school is special, bilingual, ESL, delinquent or neglected, or migrant;
- Availability and nature of summer programs;
- Estimate of three-year student stability percentage;
- Estimate of the percentage of students in combined-grade classrooms;
- Estimate of the stability of the school attendance area; and
- Names and addresses of two feed-out and two feed-in schools.



## SCHOOL INFORMATION: PRINCIPAL

This questionnaire is designed to elicit information about the characteristics of the above named school. All answers will be treated confidentially.

If you do not have time to complete this questionnaire you may wish to have it completed by one of your assistants. In that event it would be greatly appreciated if you would check it for completeness and accuracy before returning it in the postage-paid envelope.

1. Which of the following best describes the location of your school? (Check one.)

   - ☐ Large city, over 500,000 population
   - ☐ Large city, 200,000 to 500,000 population
   - ☐ Suburb of a large city
   - ☐ Rural area near a large city
   - ☐ Middle-size city, 50,000 to 200,000 population
   - ☐ Suburb of a middle-size city
   - ☐ Rural area near a middle-size city
   - ☐ Small city or town, less than 50,000 population
   - ☐ Rural area, not near a large or middle-size city

2. As of October, what was the approximate number of students in your school enrollment for the grades listed below (or by approximate grade level if your school is ungraded). Enter zero if your school does not have the grade level.

| | | |
|---|---|---|
| K ________ | 3 ________ | 6 ________ |
| 1 ________ | 4 ________ | 7 ________ |
| 2 ________ | 5 ________ | 8 ________ |

3. What is the average per-pupil expenditure in your school for 1975-76? (Include regular and supplementary funds in making your estimate.)

   $_ _ _ _

Figure III-1

School Information Questionnaire

4. Estimate the racial/ethnic composition of your school's student body. (Enter zero if your school has no students in the category: your percentages should add up to 100.)

American Indian ________ %

Asian American ________ %

Black (Negro) ________ %

Spanish surname or Spanish background (Mexican, Cuban, Puerto Rican, or other Spanish background) ________ %

White (Anglo) ________ %

Other ________ % Total 100%

5. Estimate the percentage of students in your school who are reading **one year or more** below grade level on the basis of national norms.

________ %

6. To estimate the percentage of students in your school who meet ESEA Title I poverty criteria, please answer (a) or (b), whichever is easier for you to estimate.

(a) Percentage of students in your school who meet the district's ESEA Title I poverty criteria ________ %

(b) Percentage of students in your school who are **eligible** to receive free lunches ________ %

7. Check each type of fund that your school has this year for compensatory services. (Consider as **compensatory** those services provided to educationally disadvantaged students that are in addition to, or different from, regular services.)

☐ ESEA Title I

☐ Other **Federal** funds for compensatory services

☐ Special **State** funds for compensatory services

☐ Special **District** funds for compensatory services

☐ **No** special funds for compensatory services

Figure III-1 (Continued)

School Information Questionnaire

8. Is **most** instruction in your school directed toward providing any of the following special services:

| | Yes | No |
|---|---|---|
| Bilingual or English as a second language (ESL) | ☐ | ☐ |
| Instruction for the physically handicapped | ☐ | ☐ |
| Instruction for the emotionally or mentally handicapped | ☐ | ☐ |
| Instruction for the delinquent or neglected | ☐ | ☐ |
| Instruction for children of migratory workers | ☐ | ☐ |

9. For which of the following grades in your school were academic summer programs available last summer? (Circle all that apply.)

There was a summer program in this school for the following grades.

K 1 2 3 4 5 6

There was a program in another school that our students in the following grades could attend.

K 1 2 3 4 5 6

There was a center operated by the district that our students in the following grades could attend.

K 1 2 3 4 5 6

Check here if no summer program was available for any of these grades. ☐

Check here if your school's regular academic year includes the summer. ☐

10. If you circled any grade in item 9, which of the following services were offered in the summer program? (Check all that apply.)

- ☐ Compensatory/remedial instruction in language arts or reading
- ☐ Compensatory/remedial instruction in mathematics
- ☐ Compensatory/remedial instruction in other area(s)
- ☐ Regular subject curricula that will permit student to advance to next grade level
- ☐ Enriched curriculum for volunteer qualified students

**Figure III-1 (Continued)**

**School Information Questionnaire**

11. We are interested in knowing how stable your student body is. Approximately what percentage of your students **remain** in your school throughout at least three consecutive years? If your school is less than three years old, please provide an estimate of expected stability. (Check only one.)

☐ 0-20% ☐ 41-60%

☐ 21-40% ☐ 61-80% ☐ 81-100%

12. What percentage of your students are in classes that have combined grade levels (e.g., 1-2, 3-4-5, etc.)?

________ %

13. Do you foresee a change in the school's attendance area over the next three years that is likely to have any of the following effects? (Check all that apply.)

☐ Cause the closing of the school

☐ Change the grade span of the school (e.g., become a K through 3rd grade, or a 4th through 6th grade school)

☐ Become an ungraded school or a school where most classes have combined grades

☐ No significant changes are anticipated

If your school contains all of grades one through six, skip to page 7 and complete the information asked for in item 15.

If your school **does not** contain all of grades **one through six**, please complete items 14 and 15.

14. If your school does not include all of the grades 1-6, please provide the names and addresses of the schools, with approximate percentages of students, that feed into and/or out of your school.

**Examples:**

1. If your school has only grades 4-6, provide the name and address of the school (or schools) in which most of your students attended grades 1-3.
2. If you have only grades 1-5, provide the name and address of the school (or schools) that most of your students attend for 6th grade.
3. If you have only grade 4, provide the names and addresses of the schools that most of your students attend for grades 1-3, and for grades 5-6.

**Figure III-1 (Continued)**

**School Information Questionnaire**

a. **School(s) that Feed Into Your School (Feed-in Schools)**

(1) Name ______________________________

Street Address ______________________________

City ______________________________

(a) Grades (circle grade(s) of feed in school): 1 2 3 4 5

(b) Percentage of students in your lowest grade who come from this school (circle approximate percentage):

10 20 30 40 50 60 70 80 90 100

(2) Name ______________________________

Street Address ______________________________

City ______________________________

(a) Grades (circle grade(s) of feed in school): 1 2 3 4 5

(b) Percentage of students in your lowest grade who come from this school (circle approximate percentage):

10 20 30 40 50 60 70 80 90 100

b. **School(s) to Which Your Students Go (Feed-Out Schools)**

(1) Name ______________________________

Street Address ______________________________

City ______________________________

(a) Grades (circle grade(s) of feed-out school): 3 4 5 6

(b) Percentage of your students who go to this school (circle approximate percentage):

10 20 30 40 50 60 70 80 90 100

(2) Name ______________________________

Street Address ______________________________

City ______________________________

(a) Grades (circle grade(s) of feed-out school): 3 4 5 6

(b) Percentage of your students who go to this school (circle approximate percentage):

10 20 30 40 50 60 70 80 90 100

15. Please provide the name and phone number of the person we should contact if we have any questions about the information contained here.

Thank you for your cooperation.

Figure III-1 (Concluded)

School Information Questionnaire

*The District and School Information Questionnaire.* The questionnaire addressed to superintendents (or their administrative equivalents) was parallel to the one for principals and requested additional student expenditure data. The basic information questions on the school were repeated in the questionnaire for superintendents as insurance that the information will be available for schools whose principals did not respond. Two additional questions focused on the following issues:

- Estimate of district per-pupil expenditures for 1975-76, excluding supplementary funds; and
- Estimate of district per-pupil expenditures for 1975-76 from supplementary funds from various sources.

The initial quality-control procedures for responses from the two questionnaires indicated that the responses to the per-pupil expenditure items were invalid. This invalidity was caused by lack of complete specificity in the brief questions and the wide variety of budgeting procedures employed by different districts (responses ranged from less than $5.00 per pupil to over $5,600.000 per pupil). When it became apparent that telephone discussions alone could not improve the validity of the data, we decided to delete all per-pupil expenditure data from our sample analyses.

The responses from the two questionnaires, in addition to providing information on the schools and districts for subsample monitoring, selecting, and grouping, provided information useful in two other ways: to enable us to determine if non-cooperating or "drop-out" schools were systematically different from the participating schools, and to identify schools with high student mobility or few grade levels that would not be especially useful for the longitudinal study in later years.

### Procedures for Maintaining the Sample According to the Plan

The potential bias of the Principal Sample caused by non-random incidence of nonreply to the School and District Questionnaire was the subject of two maintenance investigations. The maintenance investigations serve the purpose of maintaining the design features of the sampling plan by focusing the need for improved invitational approaches on specific types of schools. (Schools that did reply, but refused to supply information, were all telephoned, and most of them agreed to complete the questionnaire upon hearing an explanation of the study and, as a last step, being assured that completion of the school questionnaire is all that would be asked. Although the inclusion of these schools in the Principal Sample will allow for more exact population estimates, the effect of this necessary exclusion from the Representative Sample (because they refused to participate) became the subject of a series of studies to be reported in the next chapter.

### Sample Maintenance Investigations

The maintenance investigations focused on the relative incidence among sample cells of nonreply to the Principal Questionnaire. Because several different methods of questionnaire distribution were used in the questionnaire survey, both maintenance investigations provided information on how to employ follow-up procedures to address the non-response problem.

The first investigation was conducted when responses to Principal Questionnaires reached the 40-percent level (N = 2,014). A response was defined as any mailed reply to a Principal Questionnaire sent from a sample school. Replies included completed questionnaires, letter responses in lieu of questionnaires, incomplete questionnaires completed by telephone interview, responses inserted for substituted schools, and responses rejecting the study or the questionnaire. A second, parallel investigation was conducted when responses to questionnaires reached the 60-percent level (N = 3,021).

Each of the two sample-maintenance investigations consisted of 175 separate tests examining the following school-grouping categories:

- Total response by geographic region (10 tests);
- Overall response by LEA-size categories (3 tests);
- Overall response by poverty-level categories (3 tests);
- Response by LEA-size categories within regions (30 tests);
- Response by poverty-level categories within regions (30 tests);
- Overall response by combined size-poverty categories (9 tests); and
- Response by combined size-poverty categories within regions (90 tests).

Analyses of the patterns produced by the above tests reflect the extent to which significant concentrations of schools failed to respond to the questionnaire survey. The tests examined the hypothesis that responses are uniformly representative throughout all categories. The binomial expansion of $(p + q)^n$, where p reflects the proportion of total responders and n the number of schools in each grouping, was used to provide the expected distribution of replies for each experiment. Extensive tables of the binomial distribution have been compiled (Aiken, H. H., et al., 1955) that can be used to establish the limits within which the representativeness hypothesis for the given p's is tenable.

Table III-1 was compiled for the 175 different groupings of schools with p set at .40 and at .60. Accompanying each school grouping is the sample size, the response rate for two p values, and an indication if the response rate is lower than the lower limit of the range based on the .995 and .005 probability limits derived from the binomial distribution for the appropriate p value. For example, the total number of schools in the national stratified random sample for the six New England states comprising Region I is 288. The theoretical expected percentage of responses for this region is 40. The binomial percentage limits at the .995 and .005 probability levels are 33 percent and 48 percent, respectively. If the number of principals responding from this region at the 40-percent point in the survey falls within these limits, the representativeness hypothesis is tenable for Region I; otherwise it is rejected at the .01 level of confidence. Because the actual percentage at 40-percent return is 29, below the 33-percent lower limit, the representativeness hypothesis is rejected and the actual return rate is noted with an asterisk to indicate the statistically significant response shortfall. Only significant shortfalls are so noted in Table III-1.

Table III-1

Sample Maintenance Analyses

| HEW Region | LEA-Size Category | Poverty Category | Original Sample Size (n) | Percent of Replies at 40% Return | Percent of Replies at 60% Return |
|---|---|---|---|---|---|
| I | | | 288 | 29 * | 42 * |
| II | | | 377 | 15 * | 40 * |
| III | | | 591 | 41 | 60 |
| IV | | | 1,040 | 48 | 68 |
| V | | | 825 | 45 | 64 |
| VI | | | 682 | 33 * | 64 |
| VII | | | 300 | 43 | 66 |
| VIII | | | 254 | 39 | 45 * |
| IX | | | 499 | 47 | 61 |
| X | | | 179 | 40 | 61 |
| | 1 | | 1,668 | 42 | 56 * |
| | 2 | | 1,685 | 46 | 66 |
| | 3 | | 1,682 | 32 * | 57 |
| | | 1 | 1,696 | 40 | 60 |
| | | 2 | 1,654 | 40 | 61 |
| | | 3 | 1,685 | 40 | 60 |
| I | 1 | | 129 | 34 | 49 |
| I | 2 | | 112 | 30 | 46 * |
| I | 3 | | 47 | 11 * | 15 * |
| II | 1 | | 99 | 18 * | 43 * |
| II | 2 | | 110 | 15 * | 44 * |
| II | 3 | | 168 | 14 * | 36 * |
| III | 1 | | 111 | 51 | 63 |
| III | 2 | | 266 | 44 | 65 |
| III | 3 | | 214 | 32 | 51 |
| IV | 1 | | 195 | 53 | 65 |
| IV | 2 | | 463 | 54 | 69 |
| IV | 3 | | 382 | 39 | 67 |
| V | 1 | | 364 | 51 | 61 |
| V | 2 | | 220 | 55 | 74 |
| V | 3 | | 241 | 27 * | 61 |
| VI | 1 | | 252 | 27 * | 57 |
| VI | 2 | | 212 | 40 | 74 |
| VI | 3 | | 218 | 34 | 61 |
| VII | 1 | | 172 | 50 | 62 |
| VII | 2 | | 43 | 35 | 79 |
| VII | 3 | | 85 | 33 | 67 |

*Percentage (actual frequency of returns) is significantly below binomial expectation for overall return rate.

Table III-1 (continued)

Sample Maintenance Analyses

| HEW Region | LEA-Size Category | Poverty Category | Original Sample Size (n) | Percent of Replies at 40% Return | Percent of Replies at 60% Return |
|---|---|---|---|---|---|
| VIII | 1 | | 156 | 37 | 42 * |
| VIII | 2 | | 43 | 58 | 65 |
| VIII | 3 | | 55 | 31 | 38 * |
| IX | 1 | | 113 | 49 | 53 |
| IX | 2 | | 168 | 57 | 69 |
| IX | 3 | | 218 | 39 | 59 |
| X | 1 | | 77 | 38 | 56 |
| X | 2 | | 48 | 42 | 58 |
| X | 3 | | 54 | 41 | 72 |
| I | | 1 | 36 | 25 | 39 |
| I | | 2 | 100 | 25 * | 37 * |
| I | | 3 | 152 | 32 | 47 * |
| II | | 1 | 126 | 17 * | 42 * |
| II | | 2 | 78 | 9 * | 44 * |
| II | | 3 | 173 | 17 * | 38 * |
| III | | 1 | 187 | 42 | 64 |
| III | | 2 | 197 | 39 | 60 |
| III | | 3 | 207 | 41 | 56 |
| IV | | 1 | 681 | 45 | 63 |
| IV | | 2 | 300 | 56 | 76 |
| IV | | 3 | 59 | 51 | 71 |
| V | | 1 | 48 | 50 | 58 |
| V | | 2 | 285 | 38 | 61 |
| V | | 3 | 492 | 49 | 67 |
| VI | | 1 | 411 | 36 | 64 |
| VI | | 2 | 203 | 29 | 66 |
| VI | | 3 | 68 | 25 | 56 |
| VII | | 1 | 60 | 45 | 58 |
| VII | | 2 | 115 | 50 | 64 |
| VII | | 3 | 125 | 36 | 70 |
| VIII | | 1 | 64 | 34 | 41 * |
| VIII | | 2 | 104 | 41 | 47 * |
| VIII | | 3 | 86 | 40 | 47 |
| IX | | 1 | 74 | 42 | 49 |
| IX | | 2 | 222 | 46 | 59 |
| IX | | 3 | 203 | 50 | 67 |

*Percentage (actual frequency of returns) is significantly below binomial expectation for overall return rate.

Table III-1 (continued)

Sample Maintenance Analyses

| HEW Region | LEA-Size Category | Poverty Category | Original Sample Size (n) | Percent of Replies at 40% Return | Percent of Replies at 60% Return |
|---|---|---|---|---|---|
| X | | 1 | 9 | 44 | 56 |
| X | | 2 | 50 | 34 | 46 |
| X | | 3 | 120 | 42 | 68 |
| | 1 | 1 | 555 | 41 | 57 |
| | 1 | 2 | 549 | 45 | 58 |
| | 1 | 3 | 564 | 41 | 55 |
| | 2 | 1 | 567 | 48 | 68 |
| | 2 | 2 | 555 | 46 | 68 |
| | 2 | 3 | 563 | 44 | 64 |
| | 3 | 1 | 574 | 30 * | 54 * |
| | 3 | 2 | 550 | 29 * | 57 |
| | 3 | 3 | 558 | 37 | 60 |
| I | 1 | 1 | 18 | 28 | 44 |
| I | 1 | 2 | 42 | 40 | 57 |
| I | 1 | 3 | 69 | 32 | 45 |
| I | 2 | 1 | 0 | — | — |
| I | 2 | 2 | 42 | 19 * | 31 * |
| I | 2 | 3 | 70 | 37 | 56 |
| I | 3 | 1 | 18 | 22 | 33 |
| I | 3 | 2 | 16 | 0 * | 0 * |
| I | 3 | 3 | 13 | 8 | 8 * |
| II | 1 | 1 | 2 | 0 | 0 * |
| II | 1 | 2 | 23 | 30 | 52 |
| II | 1 | 3 | 74 | 15 * | 42 * |
| II | 2 | 1 | 4 | 0 | 100 |
| II | 2 | 2 | 36 | 0 * | 42 |
| II | 2 | 3 | 70 | 23 * | 41 * |
| II | 3 | 1 | 120 | 18 * | 41 * |
| II | 3 | 2 | 19 | 0 * | 37 |
| II | 3 | 3 | 29 | 10 * | 17 * |
| III | 1 | 1 | 24 | 63 | 75 |
| III | 1 | 2 | 41 | 56 | 68 |
| III | 1 | 3 | 46 | 41 | 52 |
| III | 2 | 1 | 91 | 45 | 66 |
| III | 2 | 2 | 112 | 43 | 68 |
| III | 2 | 3 | 63 | 43 | 60 |
| III | 3 | 1 | 72 | 32 | 57 |
| III | 3 | 2 | 44 | 14 * | 34 * |
| III | 3 | 3 | 98 | 40 | 55 |

*Percentage (actual frequency of returns) is significantly below binomial expectation for overall return rate.

Table III-1 (continued)

Sample Maintenance Analyses

| HEW Region | LEA-Size Category | Poverty Category | Original Sample Size (n) | Percent of Replies at 40% Return | Percent of Replies at 60% Return |
|---|---|---|---|---|---|
| IV | 1 | 1 | 164 | 49 | 62 |
| IV | 1 | 2 | 29 | 76 | 83 |
| IV | 1 | 3 | 2 | 50 | 100 |
| IV | 2 | 1 | 306 | 50 | 66 |
| IV | 2 | 2 | 147 | 59 | 74 |
| IV | 2 | 3 | 10 | 70 | 80 |
| IV | 3 | 1 | 211 | 33 | 61 |
| IV | 3 | 2 | 124 | 47 | 77 |
| IV | 3 | 3 | 47 | 47 | 68 |
| V | 1 | 1 | 37 | 51 | 59 |
| V | 1 | 2 | 119 | 53 | 61 |
| V | 1 | 3 | 208 | 50 | 61 |
| V | 2 | 1 | 5 | 40 | 60 |
| V | 2 | 2 | 38 | 58 | 82 |
| V | 2 | 3 | 177 | 55 | 73 |
| V | 3 | 1 | 6 | 50 | 50 |
| V | 3 | 2 | 128 | 17 * | 55 |
| V | 3 | 3 | 107 | 36 | 68 |
| VI | 1 | 1 | 168 | 30 | 60 |
| VI | 1 | 2 | 65 | 20 * | 51 |
| VI | 1 | 3 | 19 | 16 | 47 |
| VI | 2 | 1 | 144 | 45 | 71 |
| VI | 2 | 2 | 52 | 31 | 83 |
| VI | 2 | 3 | 16 | 25 | 75 |
| VI | 3 | 1 | 99 | 34 | 60 |
| VI | 3 | 2 | 86 | 35 | 67 |
| VI | 3 | 3 | 33 | 30 | 52 |
| VII | 1 | 1 | 32 | 41 | 47 |
| VII | 1 | 2 | 84 | 48 | 61 |
| VII | 1 | 3 | 56 | 59 | 71 |
| VII | 2 | 1 | 3 | 100 | 100 |
| VII | 2 | 2 | 9 | 56 | 100 |
| VII | 2 | 3 | 31 | 23 | 71 |
| VII | 3 | 1 | 25 | 44 | 68 |
| VII | 3 | 2 | 22 | 55 | 64 |
| VII | 3 | 3 | 38 | 13 * | 68 |

*Percentage (actual frequency of returns) is significantly below binomial expectation for overall return rate.

Table III-1 (concluded)

Sample Maintenance Analyses

| HEW Region | LEA-Size Category | Poverty Category | Original Sample Size (n) | Percent of Replies at 40% Return | Percent of Replies at 60% Return |
|---|---|---|---|---|---|
| VIII | 1 | 1 | 64 | 34 | 41 * |
| VIII | 1 | 2 | 68 | 38 | 44 * |
| VIII | 1 | 3 | 24 | 38 | 42 |
| VIII | 2 | 1 | 0 | – | – |
| VIII | 2 | 2 | 19 | 68 | 74 |
| VIII | 2 | 3 | 24 | 50 | 58 |
| VIII | 3 | 1 | 0 | – | – |
| VIII | 3 | 2 | 17 | 24 | 29 |
| VIII | 3 | 3 | 38 | 34 | 42 |
| IX | 1 | 1 | 37 | 46 | 49 |
| IX | 1 | 2 | 44 | 50 | 59 |
| IX | 1 | 3 | 32 | 50 | 50 |
| IX | 2 | 1 | 14 | 57 | 71 |
| IX | 2 | 2 | 84 | 62 | 71 |
| IX | 2 | 3 | 70 | 50 | 66 |
| IX | 3 | 1 | 23 | 26 | 35 |
| IX | 3 | 2 | 94 | 30 | 49 |
| IX | 3 | 3 | 101 | 50 | 73 |
| X | 1 | 1 | 9 | 44 | 56 |
| X | 1 | 2 | 34 | 41 | 53 |
| X | 1 | 3 | 34 | 32 | 59 |
| X | 2 | 1 | 0 | – | – |
| X | 2 | 2 | 16 | 19 | 31 |
| X | 2 | 3 | 32 | 53 | 72 |
| X | 3 | 1 | 0 | – | – |
| X | 3 | 2 | 0 | – | – |
| X | 3 | 3 | 54 | 41 | 72 |

*Percentage (actual frequency of returns) is significantly below binomial expectation for overall return rate.

Whenever the representativeness hypothesis was rejected for a sample cell and the number of responses was less than the lower hypothesis limit, the Field Operations staff of the Sustaining Effects Study investigated the procedures used to distribute questionnaires and frequently contacted schools in that cell to determine how procedures might be improved. The maintenance investigations also provided the Field Operations Staff with response information by state, because many states employed centralized authorities to handle the receipt, distribution, or return of questionnaires.

From Table III-1, it can be seen that at the 40-percent response point, significantly lower response rates characterized the New England, Metropolitan Northeast, and South Central geographic regions. These shortfalls were largely explainable by late responses in three states that had centralized distribution and/or collection of the questionnaires at the state level. It can also be seen that the middle-sized LEAs had the best response rate, except for the regions named above. Large LEAs, overall, had a high non-response rate, expectable from the nature of their organizational complexity. There were no overall differences in response rates attributable to poverty level. The greatest specific shortfall of responses was in the large-LEA, mid-poverty schools. These schools are those in the largest cities, where the districts typically exercise control of distribution and collection of the questionnaires.

At the 60-percent response point, four states with centralized questionnaire handling still accounted for most of the significant non-response tendencies. Schools in small LEAs were also notably below expectation, but there were no significant poverty trends.

### The Non-Respondent Analysis

At the time of the termination of further solicitation of completed questionnaires, only 25 of the 5,035 schools in the Principal Sample (less than .5 percent) had failed to respond. Because p at this point was .995, a series of binomial tests was considered inappropriate. The distribution of the 5,010 responding schools was, however, compared by the chi-square test to the distribution of the 5,035 schools in the Principal Sample over the sampling matrix. The resulting chi-square test yielded a value of 1.1533, which, with 36 degrees of freedom, is nowhere near the value necessary to reject the null hypothesis that the replying schools are distributed proportionally over the matrix according to the sampling plan. (It may be of passing interest to note, however, that a significant portion of the 25 non-replying schools came from either one large city or one large state. While the large city and the large state may be under-represented in the sample, their respective regions, LEA-size categories, and LEA-poverty categories are not systematically under-represented. It may be of further interest to note that for various reasons to be discussed later – such as having high random-selection numbers within their respective sampling cells or participating in another federal study – 16 of the 25 non-responding schools would not have been selected for the first-year Representative Sample.)

# CHAPTER IV. THE FIRST-YEAR REPRESENTATIVE SAMPLE

The 5,010 Principal Questionnaires were reviewed and subjected to quality-control procedures upon receipt. Whenever a questionnaire was incomplete, incorrectly responded to, or contained responses that looked improbable or incompatible with other responses, the parallel district questionnaire was consulted or the contact person named on the questionnaire was telephoned to obtain acceptable data. On the basis of the responses, 260 schools were eliminated from further consideration because of any of the following reasons:

- Most of the instruction was bilingual or ESL;
- Most of the instruction was for the physically handicapped;
- Most of the instruction was for the emotionally or mentally handicapped;
- Most of the instruction was for neglected or delinquent students;
- Most of the instruction was for children of migratory workers;
- The school was closed;
- The school confidently anticipated being closed by the Fall of 1976; or
- The school no longer had any grades in the 1-6 range.

The closed and ineligible schools should have been identified at the much earlier stage when eligible schools were selected from the MDR data tapes. The failure to identify them at that earlier stage is probably due to inconsistencies between our definitions of ineligibility and the information on the data tape, and to changes in the status of the schools. Schools with any of the characteristics listed above were eliminated from further consideration on the premise that they did not truly belong to the universe with which the Sustaining Effects Study is concerned.

The elimination of the 260 closed and ineligible schools left a sample of 4,750 schools that was to serve two purposes: first, to enable us to select an appropriate Representative Sample for the first year of the study, and second, to make population projections against which projections from the Representative Sample could be compared to ascertain its ability generally to represent the universe. Although all 4,750 responding and eligible schools would serve the population-projection purpose, two groups of them were not allowed to be selected into the Representative Sample.

The first group was composed of schools in districts that were participating in the NIE Demonstration Project. Representatives of the NIE and the USOE had agreed that participation in both studies would constitute an excessive burden for any school, and since the Demonstration Project districts had already been selected, the participating schools should not be asked to participate in the Sustaining Effects Study. Review of the NIE documents on the selection procedures for the Demonstration Project indicated that the schools were not atypical, and that there was no **a priori** reason to eliminate them from our universe, even though we eliminated them from participation in the study. On this line of reasoning, 56 schools in the NIE study were kept in the sample of 4,750 for purposes of making population projections, but were not allowed in the Representative Sample. (It should be noted that six of the 56 schools would have been invited to participate because of their low random-selection numbers. No special analysis was performed, however, to determine whether the systematic bypassing of those six schools influenced the nature of the Representative Sample.)

The second group of schools not allowed into the Representative Sample was composed of 76 schools that expressed great negativism toward the study in their initial responses to the Principal Questionnaires. As a precondition to obtaining their questionnaire responses, necessary for accurate population projections, these schools were promised immunity from further participation. Fortunately, the 76 schools had such high random-selection numbers within their respective cells, that none would have been selected for the first-year Representative Sample, even if they had been more eager. No special analysis was made of this group of schools because there was no logical way to assume that they were different from the remaining schools in any way other than their early and forthright candor. That is, we felt we could not differentiate these schools from other schools that would eliminate themselves from the study much later. The fact that our sampling procedure was sequential over almost a year, with no firm commitment of the schools until the very end, caused this definitional problem of who refused and who did not, just as it caused similar problems with responders and non-responders. The important question, to which we will never know the answer, is this: How many of the schools, if invited, would have eventually refused to participate? Because only a small number of schools were finally invited, we cannot know how the refusing schools might be different.

### The Selection of the Representative Sample

The remaining 4,618 schools constituted the sample from which the first-year Representative Sample was to be drawn. Schools with the three lowest random-selection numbers in each cell of the sampling matrix were invited to participate in the study. Because six of the cells had no schools; two cells contained only two schools each, due to exceptions described above; and one extra school was invited from the cell with the largest population, invitations for the Representative Sample were issued to 251 schools. With the few minor exceptions described above, this sample was nationally representative and would provide data that, when appropriately weighted, would yield unbiased descriptors of the state of the Nation's elementary education efforts.

### Replacements to the Representative Sample

Invitations to participate in the study were sent to the 251 schools during April of 1976. During the late Spring and Summer, the principals, teachers, communities, and school boards reached final decisions to accept or reject the invitations. Whenever a rejection was received, the school was called or visited in an effort to induce reconsideration. At no time did the study personnel indicate that participation might be legally required or that there might be any kind of retaliation for non-participation. When efforts to induce reconsideration failed, the rejecting school was deleted from the sample and the uninvited school with the lowest remaining random-selection number in the cell was invited to serve as a replacement. By September 1, the date at which no more replacements were invited, 34 schools had rejected their invitations and 33 replacements had accepted. Afterwards, seven more schools rejected their invitations, but were not replaced.

In total, 41 of the originally selected 251 schools eliminated themselves from further participation in the study, and 33 additional schools partially replaced them. As assurance that the Representative Sample had not been significantly biased toward some type of school (schools that are less pressured from other sources, more cooperative, less cynical, or less aggressive, as possibilities), the 33 replacement schools were compared to the 41 "drop-outs" on a number of characteristics.

### Sample Replacement Analyses

A series of statistical comparisons was made to determine whether the 33 replacement schools differed in a significant manner from the 41 "drop-out" schools. The characteristics selected as the bases for the comparisons were location, enrollment, grade range, race/ethnicity, student achievement, student poverty, school receipt of compensatory funding, student-body mobility, and incidence of combined grades. The comparisons of this group of characteristics would indicate not only if the replacement procedure resulted in distortions of the Representative Sample in terms of its ability to represent the nation, but also if it resulted in schools less valuable to the analytic studies.

*School Urbanism.* Seven categories of school urbanism, or population density, were formed for this comparison. Table IV-1 describes the categories and presents the incidence of schools in each of the two groups in each category.

Table IV-1

Comparison of Drop-Out and Replacement Schools by Urbanism

| | Drop-Out Schools | | Replacement Schools | |
|---|---|---|---|---|
| Location of School | Number | Percent | Number | Percent |
| City over 500,000 | 2 | 4.9 | 4 | 12.1 |
| City of 200,000-500,000 | 4 | 9.8 | 0 | 0.0 |
| City of 50,000-200,000 | 8 | 19.5 | 5 | 15.2 |
| Suburb of city | 7 | 17.1 | 7 | 21.2 |
| City under 50,000 | 11 | 26.8 | 4 | 12.1 |
| Rural area near city | 4 | 9.7 | 4 | 12.1 |
| Rural area not near city | 5 | 12.2 | 9 | 27.3 |
| Totals | 41 | 100.0 | 33 | 100.0 |

The chi-square value computed from the numbers in the table above is 9.0, with six degrees of freedom, which is not significant. In addition, seven separate t-tests that were computed to compare the percentages within each location category were not significant. Based on both sets of findings, we concluded that the two samples cannot be assumed to have come from different populations with respect to school urbanism.

*Student Enrollment.* The total student enrollment in grades 1-6 formed the second characteristic on which the replacement and drop-out schools were compared. Table IV-2 presents the means and standard deviations of the enrollments in the two groups and the t-test value for a test of the significance of differences between independent means.

Table IV-2

Comparison of Drop-Out and Replacement Schools
by Student Enrollment

| Schools | Mean Enrollment | Standard Deviation | t-value |
|---|---|---|---|
| Drop-out schools | 342.5 | 182.5 | 0.40 |
| Replacement schools | 325.7 | 180.4 | |

Although the replacement schools have slightly smaller total enrollments, the difference is not sufficiently large to lead us to believe that the two groups represent different school populations.

*Grade Range.* The third characteristic used to compare the two groups of schools was the range of grades within the schools. We were concerned that the replacement sample not be composed of more partial-grade-range or full-grade-range schools than those in the drop-out sample. Table IV-3 provides information on the percentage of full-range (1-6) schools in each sample.

Table IV-3

Comparison of Drop-Out and Replacement Schools by Grade Range

| Schools | Mean Percentage With All Six Grades | Standard Deviation | t-value |
|---|---|---|---|
| Drop-out schools | 51.2 | 50.6 | -1.90 |
| Replacement schools | 72.7 | 45.2 | |

The replacement group of schools has a higher percentage of schools with complete grade ranges, but the difference is not statistically significant.

*Student Race/Ethnicity.* It was also important to demonstrate that the replacement schools were not systematically more or less representative of minority students. The percentages of each of five types of students were compared for the two groups of schools and are presented in Table IV-4.

Table IV-4

Comparison of Drop-Out and Replacement Schools
by Student Race/Ethnicity

| Racial/Ethnic Group | Percentage Enrolled in Drop-Out Schools: Mean | Percentage Enrolled in Drop-Out Schools: Standard Deviation | Percentage Enrolled in Replacement Schools: Mean | Percentage Enrolled in Replacement Schools: Standard Deviation | t-value |
|---|---|---|---|---|---|
| American Indian | 1.2 | 3.8 | 1.8 | 7.8 | -0.41 |
| Asian-American | 1.0 | 2.3 | 0.6 | 1.0 | 1.02 |
| Black | 19.4 | 30.4 | 16.4 | 29.4 | 0.43 |
| Spanish Heritage | 8.1 | 14.2 | 8.8 | 17.8 | -0.19 |
| White | 70.2 | 33.3 | 72.4 | 31.8 | -0.29 |

The data in Table IV-4 indicate that the replacement schools are characterized by slight and non-significant increases in the percentages of American Indian students, Spanish-surname or Spanish-heritage students, and White students, and by slight and non-significant decreases in Asian-American and Black students.

*Student Achievement Level.* The fifth characteristic on which the two groups of schools were compared was the percentage of students reported reading one year or more below grade level. Clearly, such percentages should have a direct bearing upon the types of schools studied. Table IV-5 presents the comparison data on the reading achievement characteristic.

The replacement schools have a slightly but non-significantly larger percentage of students reading below their grade levels.

Table IV-5

Comparison of Drop-Out and Replacement Schools
by Student Achievement Level

| Schools | Percentage of Students Reading One Year or More Below Grade-Level: Mean | Standard Deviation | t-value |
|---|---|---|---|
| Drop-out schools | 27.1 | 16.6 | -0.44 |
| Replacement schools | 29.1 | 22.6 | |

*Poverty.* For purposes of this comparison, we defined poverty as the larger of two numbers that the Principal reported. The Principal was asked to provide the percentages of students who met the district's Title I poverty criteria and of students who were eligible to receive free lunches. Both questions were asked because many schools may not know the answer to one, but can supply the answer to the other. The higher response to either of the questions was taken as the indicator of poverty. The percentages of two groups of schools are presented in Table IV-6.

Table IV-6

Comparison of Drop-Out and Replacement Schools
by Poverty Percentages

| Schools | Percentage of Students Eligible for Title I Poverty: Mean | Standard Deviation | t-value |
|---|---|---|---|
| Drop-Out schools | 20.0 | 28.8 | -0.17 |
| Replacement schools | 31.1 | 28.8 | |

The replacement schools showed a slight but non-significant increase in the percentage of poverty students.

*Compensatory Funding.* The schools were categorized into five (not mutually exclusive) groups of different compensatory funding according to which funds the school received. The differences between the two groups of schools on each type of funding are presented in Table IV-7.

Table IV-7

Comparison of Drop-Out and Replacement Schools by Compensatory Funding

| Compensatory Funding Source | Percentage Funded Among Drop-Out Schools: Mean | Percentage Funded Among Drop-Out Schools: Standard Deviation | Percentage Funded Among Replacement Schools: Mean | Percentage Funded Among Replacement Schools: Standard Deviation | t-value |
|---|---|---|---|---|---|
| Title I | 51.2 | 50.6 | 63.6 | 48.9 | -1.07 |
| Other Federal | 26.8 | 44.9 | 24.2 | 43.5 | 0.25 |
| State | 51.2 | 50.6 | 45.4 | 50.6 | 0.49 |
| District | 17.1 | 38.1 | 9.1 | 29.2 | 0.99 |
| No Funds | 21.9 | 41.9 | 24.2 | 43.5 | -0.23 |

None of the tests on the comparisons between school groups on the basis of the source of compensatory-program funding were significant. Differences between groups varied for the different funding sources, but were not statistically significant for any of the sources.

*Student-Body Stability.* Table IV-8 compares the two groups of schools with respect to three categories of student-body stability over a three-year period.

Table IV-8

Comparison of Drop-Out and Replacement Schools
by Student-Body Stability

| Three-Year Stability (Non-Mobility) of Student-Body | Drop-Out Schools: Number | Drop-Out Schools: Percent | Replacement Schools: Number | Replacement Schools: Percent |
|---|---|---|---|---|
| Low Stability (0-60%) | 10 | 24.4 | 6 | 18.2 |
| Medium Stability (61-80%) | 7 | 17.1 | 13 | 39.4 |
| High Stability (81-100%) | 24 | 58.5 | 14 | 42.4 |
| Totals | 41 | 100.0 | 33 | 100.0 |

The chi-square value computed from the numbers of Table IV-8 is 4.6 with 2 degrees of freedom, which is not significant. In addition, three t-test comparisons of the percentages for each student-stability category were performed and found to be non-significant. The interpretation of these results was that the two groups of schools could not be considered to have come from different populations with respect to student-body stability.

*Incidence of Combined Grades.* The last characteristic used to compare the drop-out group to the replacement group of schools in order to determine if the two groups were significantly different was the incidence of the combination of two or more grade levels within the school. Table IV-9 presents the means and standard deviations of the percentages of schools in each group that have combined grade levels.

Table IV-9

Comparison of Drop-Out and Replacement Schools
by Incidence of Combined Grades

| Schools | Mean Incidence | Standard Deviation | t-value |
|---|---|---|---|
| Drop-out schools | 43.9 | 50.2 | 0.39 |
| Replacement schools | 39.4 | 49.6 | |

The replacement schools are not significantly different from the drop-out schools in terms of the incidence of combined-grade classrooms.

On the basis of the nine statistical comparisons described above, it is safe to conclude that the drop-out schools and the replacement schools do not differ significantly. Thus, there is no evidence to suggest that non-random events caused the drop-out schools to decline participation in the study.

### The Final First-Year Representative Sample

At the beginning of the school year of the first operational year of the Sustaining Effects Study, the Representative Sample was composed of 243 schools (251 - 41 + 33 = 243). This sample of schools would form the basis for the national projections that would be made for the study and would provide the students for the Participation Study. The distribution of the 243 schools along the dimensions of the sampling matrix is presented in Table IV-10 to provide the reader with an additional description of the composition of the Representative Sample

When these numbers are compared with the numbers expected from the ideal sample of 251 schools originally invited, it can be seen that there is a slight shortage of schools in the Metropolitan Northeast and the Pacific Southwest regions, in large LEAs, and in districts

Table IV-10

Distribution of the 243 Schools in the First-Year Representative Sample by Region, Size of LEA, and LEA Poverty Status

| Region | Number of Schools | Size of LEA | Number of Schools | LEA Poverty Status | Number of Schools |
|---|---|---|---|---|---|
| New England | 24 | Small | 88 | High Poverty | 71 |
| Metropolitan Northeast | 23 | Medium | 80 | Medium Poverty | 84 |
| Mid-Atlantic | 26 | Large | 75 | Low Poverty | 88 |
| Southeast | 25 | | | | |
| North Midwest | 29 | | | | |
| South Central | 27 | | | | |
| Central Midwest | 27 | | | | |
| North Central | 21 | | | | |
| Pacific Southwest | 24 | | | | |
| Pacific Northwest | 17 | | | | |

with high and medium poverty levels. Because the three sampling strata dimensions will be appropriately weighted in all population projections, there was no need to test for significant deviations from the ideal distribution of the 251 schools; the weighting procedures would adjust for any deviations.

## Sample Adequacy Analysis

While there is no need to test the distribution of the 243 schools over the dimensions of the sampling matrix, there is a need to test the adequacy of the Representative Sample for drawing inferences about the population. That is, after the first-year Representative Sample is appropriately weighted, how well will it approximate our best description of the population in terms of several important characteristics? The following method was developed for statistically ascertaining the adequacy of the final first-year Representative Sample of 243 schools.

- Using the item responses to the Principal Questionnaire, a list of characteristics was constructed for each of the schools in the Respondent Sample of 4,750 schools.
- The data on these characteristics for the 243 representative schools, contained within the Respondent Sample, were extracted and treated as a separate sample to be compared with the total Respondent Sample. (It follows, then, that the two samples will not technically be independent. Statistical tests that assume independence of the samples were more appropriate, however, than those that assume dependence. Therefore, the statistical tests to be described are likely to be less able to reject false null hypotheses than their significance levels would indicate.)

- Stratified and weighted means and standard errors were projected from the two samples to the U.S. school population as previously defined. The projections from the 4,750-school Respondent Sample were considered to be highly accurate descriptors of the population because the sample was large and minimally biased. Those projections would serve, then, as the population standard against which the adequacy of the projections from the Representative Sample would be compared.
- The two projected means for each characteristic were then tested by a $\bar{Z}$ test for the significance of differences between independent means, in order to determine if the observed differences were statistically significant.
- If the means for a characteristic were significantly different at the .05 level of confidence, i.e., if the Z ratio equalled or exceeded 1.96, the Representative Sample was considered to be unable to provide an unbiased population estimate of the characteristic projected.

In each of the sections below, a characteristic or group of characteristics is projected from each of the two samples, and the differences are compared as a test of adequacy of the Representative Sample to provide population estimates.

*School Urbanism.* The first set of comparisons determines whether the Representative Sample, when appropriately weighted across the sampling cells, provides a projection of percentages of schools in various locations that is different from that provided by the Respondent Sample. Table IV-11 presents the projected percentages and their respective $\bar{Z}$ tests.

Table IV-11

Comparison of Projected Percentages of Schools by Degree of Urbanism

| Location of School | Respondent Sample |  | Representative Sample |  |  |
|---|---|---|---|---|---|
|  | Mean | Standard Error | Mean | Standard Error | $\bar{Z}$ Ratio |
| City over 500,000 | 7.28 | 0.22 | 7.57 | 1.39 | -0.21 |
| City of 200,000–500,000 | 3.89 | 0.22 | 3.22 | 1.25 | 0.53 |
| City of 50,000–200,000 | 10.65 | 0.39 | 12.19 | 2.20 | -0.69 |
| Suburb of city | 14.80 | 0.54 | 13.56 | 2.97 | 0.41 |
| City under 50,000 | 27.96 | 0.69 | 24.96 | 3.89 | 0.76 |
| Rural area near city | 10.56 | 0.50 | 11.41 | 2.73 | -0.31 |
| Rural area not near city | 24.87 | 0.59 | 27.08 | 3.32 | -0.66 |
| Totals | 100.1 |  | 99.9 |  |  |

The $\overline{Z}$ ratios computed from the means and standard errors are all non-significant, indicating that the findings from the Representative Sample will not likely be biased by non-representativeness of school locations.

*Student-Body Stability.* The second set of comparisons tests the ability of the Representative Sample to provide population estimates that are not biased by differences in schools' student-body stability over a three-year period. Table IV-12 presents projections of this characteristic by showing the projected percentages and standard errors of schools falling into three student-stability categories.

Table IV-12

Comparison of Projected Percentages of Schools by Category of Student-Body Stability

| Three-Year Stability (Non-Mobility) of Student-Body | Respondent Sample | | Representative Sample | | $\overline{Z}$ Ratio |
|---|---|---|---|---|---|
| | Mean | Standard Error | Mean | Standard Error | |
| Low (0-60%) | 17.42 | 0.52 | 13.39 | 2.82 | 1.40 |
| Medium (61-80%) | 23.41 | 0.64 | 28.72 | 3.56 | -1.47 |
| High (81-100%) | 59.17 | 0.69 | 57.90 | 3.84 | 0.33 |
| Totals | 100.00 | | 100.01 | | |

None of the $\overline{Z}$ ratios computed from the projected means and standard errors are significant. This supports the view that findings from the Representative Sample will not be biased by non-representation of student-body stability.

*Enrollment, Race/Ethnicity, and Poverty.* Table IV-13 provides a series of student-count (not school-count) projections and comparisons for various enrollment categories. Each projection calculates the estimated number of students in the average school in the population. The second column of the table is an actual count of the number of schools in the population to which the projections are made.

The sampling cell weights based on 62,534 schools were used for the grade enrollment projections, even though the population number of schools having each grade differed somewhat from grade to grade (some schools do not have a first grade, a second grade, etc.). The amount of discrepancy introduced into the grade-enrollment projections is believed to be small, since both the numerator and the denominator used to compute the sampling cell weights would be proportionally reduced by using the slightly smaller population values shown in the second column of Table IV-13. A very similar phenomenon exists

## Table IV-13

### Comparison of Projected Numbers of Students by Enrollment, Race/Ethnicity, and Poverty

| Enrollment Characteristic | Number of Schools in Population | Respondent Sample | | Representative Sample | | $\overline{Z}$ Ratio |
|---|---|---|---|---|---|---|
| | | Mean | Standard Error | Mean | Standard Error | |
| School Enrollment, grades 1-6 | 62,534 | 333.93 | 2.90 | 320.05 | 17.33 | 0.79 |
| Grade 1 Enrollment | 55,377 | 62.82 | 0.56 | 59.79 | 3.28 | 0.91 |
| Grade 2 Enrollment | 55,501 | 58.74 | 0.51 | 55.21 | 3.01 | 1.16 |
| Grade 3 Enrollment | 55,364 | 58.91 | 0.51 | 54.53 | 2.95 | 1.46 |
| Grade 4 Enrollment | 54,513 | 60.70 | 0.53 | 55.91 | 3.09 | 1.53 |
| Grade 5 Enrollment | 52,808 | 65.95 | 0.62 | 61.47 | 3.53 | 1.25 |
| Grade 6 Enrollment | 47,983 | 75.63 | 0.93 | 73.01 | 5.22 | 0.49 |
| American-Indian Enrollment | 62,534 | 3.03 | 0.29 | 2.92 | 1.68 | 0.06 |
| Asian-American Enrollment | 62,534 | 3.18 | 0.22 | 3.18 | 1.24 | 0.00 |
| Black Enrollment | 62,534 | 54.01 | 1.36 | 42.87 | 8.65 | 1.27 |
| Spanish Enrollment | 62,534 | 19.19 | 0.74 | 18.17 | 4.57 | 0.22 |
| White Enrollment | 62.534 | 254.50 | 2.73 | 252.91 | 16.16 | 0.10 |
| Poverty Students | 62,534 | 94.79 | 1.37 | 92.77 | 8.70 | 0.23 |

with the racial/ethnic projections. Quite obviously, not every elementary school in the nation has American-Indian or Asian-American students (or, for that matter, any one of the categories). The determination of the true population number was not possible, because there is no data base on race/ethnicity that includes all the schools (or a non-systematically biased sample) of the national population.

The $\overline{Z}$ ratios in the last column of the table indicate that the findings from the Representative Sample will not be significantly biased by non-representativeness on the characteristics of enrollments, race/ethnicity, or student poverty.

The second column of Table IV-13 provides numbers that may be used in the projection of total student counts for the national population. For example, by multiplying the projected Respondent Sample mean value of 94.79 for poverty students by 62,534, we arrive at a projected value of 5,927,598 students in the nation's public schools in grades 1-6 who are (or, more accurately, were described by their principals as being) from low-income families. The standard error of this projection is 1.37 times 62,534, which equals 85,672 students. A confidence band of ±1.96 (95 percent) or ±2.58 (99 percent) standard errors may be attached to such projections to compute the confidence region within which the population values can be inferred to be contained.

This estimate of poverty students seems quite inflated. The Survey of Income and Education (Census Bureau and Department of Health, Education, and Welfare, 1976), conducted between April and July of 1976 (partly concurrently with this survey), showed that the number of school-age children (5 to 17 years old) living below the poverty level was 7,131,520. When that figure is prorated for ages 6 through 11 (typical ages in grades 1 through 6), the result is 3,236,536. The census counts, however, exclude children living in institutions or publicly supported foster homes and children in AFDC families receiving payments above the poverty line. Because many of these children are likely to have been counted by the responding principals, the augmented count (Miller, 1977) for 1976 of 8,793,490 "eligible children" may be more appropriate. The prorated number for grades 1 through 6 is 3,990,794.

The over-estimate of 49 percent needs some explanation, especially in light of the accuracy of all the other estimates made from the Principal Questionnaire. The gross over-estimation of the number of poverty children in the nation that resulted from our survey data led us to reject our original supposition that a school's reported percentage of students eligible for Title I and percentage of students eligible for free lunches were interchangeably accurate indexes of school poverty. The complications in the laws and regulations governing eligibility for each program make the percentages subject to many considerations other than just poverty. The non-interchangeability of the percentages, as indexes of poverty, was empirically shown by a correlation of .846 between the two responses, based on 1,307 schools in the Respondent Sample for which non-zero responses were supplied for both poverty questions. The mean and standard deviation for the Title I-eligibility item were 29.7 percent and 24.1 percent, and for the free lunch-eligibility item, 35.8 percent and 27.5 percent. Taking the higher of the two percentages, as we did, led to the over-estimation. It did not appear that the responses could be adjusted in any defensible way to obtain a more accurate poverty index.

The effects of our over-estimation of poverty level of schools upon the tabulations in Chapter VII should be mentioned at this time. Because the tabulations are all made in terms of rough categories of poverty (0-20% poor; 21-50% poor, and 51-100% poor), the inaccuracies in individual school poverty level should have a very small effect upon the relationships uncovered in the tabulations.

Table IV-14 presents a comparison of projected percentages for the school population by four types of grade spans. The first type described is for schools having all six of the elementary grades. The "feeder" elementary schools send their students into another elementary school, because they lack a grade 6. The "primary" schools generally lack grades 4, 5, and 6, while the "intermediate/middle" schools are those that lack the early grades.

None of the $\bar{Z}$ ratios in the table above is statistically significant, although the Representative Sample's over-estimate of the percentage of complete-span and its under-estimate of the percentage of feeder schools approaches the .05 level of significance. A check of the original MDR data base, which serves as the population, indicated that 67.15 percent of the schools are complete elementary schools. This check supports the extreme accuracy of the projections made from the Respondent Sample, but does not increase our confidence that the projection made from the Representative Sample is highly accurate. The non-significance of the $\bar{Z}$ ratio nonetheless indicates that findings from the Representative Sample will not be biased by grade-range characteristics of the sample.

### Table IV-14

### Comparison of Projected Percentages of Schools by Type of Grade Span

| Type of Grade Span | Respondent Sample | | Representative Sample | | |
|---|---|---|---|---|---|
| | Mean | Standard Error | Mean | Standard Error | $\overline{Z}$ Ratio |
| Complete Elementary | 67.13 | 0.71 | 75.05 | 4.06 | -1.92 |
| Feeder Elementary | 12.38 | 0.50 | 6.72 | 2.86 | 1.95 |
| Primary School | 10.10 | 0.48 | 9.24 | 2.65 | 0.32 |
| Intermediate/Middle | 10.39 | 0.47 | 8.99 | 2.73 | 0.51 |
| Totals | 100.00 | | 100.00 | | |

*Compensatory-Education Funding.* Table IV-15 presents comparisons of the types of compensatory funding received by schools. The first four percentages are not mutually exclusive, as they reflect joint funding from several sources that may be received by any school. The last four percentages are based on mutually exclusive categories and add to 100 percent.

### Table IV-15

### Comparison of Projected Percentages of Schools Receiving Compensatory Funds from Various Sources

| Category of Compensatory Funding Source | Respondent Sample | | Representative Sample | | |
|---|---|---|---|---|---|
| | Mean | Standard Error | Mean | Standard Error | $\overline{Z}$ Ratio |
| Title I Funded | 67.45 | 0.66 | 73.76 | 3.65 | -1.70 |
| Other Federal Funds | 28.33 | 0.68 | 29.73 | 3.88 | -0.36 |
| State Funded | 41.82 | 0.75 | 44.70 | 4.22 | -0.67 |
| District Funded | 15.52 | 0.57 | 20.38 | 3.16 | -1.51 |
| Funded Only by Title I | 26.27 | 0.67 | 28.83 | 3.81 | -0.66 |
| Title I Plus Other | 41.20 | 0.74 | 44.93 | 4.15 | -0.88 |
| Non-Title I Only | 14.30 | 0.52 | 13.36 | 2.87 | 0.32 |
| No Compensatory Funds | 18.23 | 0.57 | 12.89 | 3.09 | 1.70 |

There is a slight but consistent tendency for the Representative Sample to provide population projections that over-estimate the percentages of schools receiving compensatory-education funds and that under-estimate the percentage not receiving the funds. This is probably caused by the inability of the weighting procedures to cancel completely the disproportionality of high-poverty schools introduced by the poverty dimension of the sampling matrix. However, none of the $\bar{Z}$ ratios shown in the last column is significant, lending support to the conclusion that the findings of the Representative Sample will not be biased by compensatory-education funding characteristics of the sample.

The projected percentages shown in Table IV-15 provide interesting descriptive information concerning the funding of compensatory-education services. For example, one can infer with reasonable confidence that 26.27 percent of the U.S. public schools operating any or all of grades 1-6 are completely dependent on Title I funds for supporting their compensatory-education programs, while 18.23 percent of the schools have no compensatory-education funds, and presumably have no compensatory programs. The precision of these estimates is within 2 percent by typical survey standards.

*Achievement Level, Grade Combinations, and Summer-School Availability.* Table IV-16 provides projected percentages and comparisons for three additional variables that are relevant to the Sustaining Effects Study. These are the percentage of students reading one year or more below national grade-level norms, the incidence of combined-grade operations, and the availability of summer school.

Table IV-16

**Comparison of Projected Percentages of Students Reading One Year or More Below Grade Level and of Schools With Combined Grades and With Summer School**

| Student and School Characteristic | Respondent Sample | | Representative Sample | | |
|---|---|---|---|---|---|
| | Mean | Standard Error | Mean | Standard Error | $\bar{Z}$ Ratio |
| Percentage of Students Reading Below Level | 25.89 | 0.24 | 27.67 | 1.37 | -1.28 |
| Percentage of Schools With Combined Grades | 42.47 | 0.71 | 44.63 | 4.01 | -0.53 |
| Percentage of Schools With Summer School | 50.98 | 0.70 | 53.77 | 3.91 | -0.70 |

None of the $\bar{Z}$ ratios in the table is significant, indicating that the findings from the Representative Sample will not be biased by those characteristics of the sample. Descriptively, the projections reveal that, with a precision of 2 percent, 50.98 percent of the population schools have summer school available for their students, either at school, at a neighboring school, or within the district. Also, 25.89 percent of the students in the population are reported to be reading at an achievement level one or more years below that expected on the basis of national norms. This high percentage corresponds fairly well with the projections made on the basis of the published norms of the major reading achievement tests. In the norm projections, the percentage of students reading at least one year below grade-level is about 10 to 15 percent at the first grade, but rises to 30 percent or more by the sixth grade.

## Procedures for Projecting Sample Characteristics to the Population

Projections from various samples to the population have been presented in the first part of this chapter and will constitute much of the last chapter of this report. In addition, the Participation Study will project sample characteristics to the national population so that policymakers will have an accurate picture of the nature, extent, and distribution of compensatory-education efforts. In this section, methods are provided for obtaining such projections, along with methods for evaluating their accuracy.

Projections are made of school characteristics and of student characteristics, and both types of characteristics come from the Respondent Sample (4,750 schools), the first-year Representative Sample (243 schools), or the Participation Sample (15,000 students). All of the samples can be described in terms of the 90 cells of the sampling matrix. The known characteristics of the factorial structure of this matrix, both for the population and for each of the samples (characteristics of both schools and students), allows for the appropriate weighting of any obtained information in order to make rather accurate estimates of what the information would be like if all the schools or all the students had been surveyed.

Fundamental population characteristics, such as average size and relative variance of school grade within cell, that are required for precision estimates (standard errors) will be derived from the survey data for the 4,750 schools in the Respondent Sample. The MDR population counts by cells, as refined by the more precise ratio estimates obtained from the Respondent Sample, will be used to weight the cells in the sampling structure, while selected data from the first-year Representative Sample will be used to obtain the estimates for each cell.

## Projecting School Characteristics

The estimation of school parameters is less complicated than the estimation of student parameters, not only because there are fewer schools than students and they are less variable, but also because more information is known about the schools, and therefore less has to be estimated in order to provide meaningful national projections. For the Sustaining Effects Study, it is necessary to compute only population estimates and the standard errors associated with those means. Using such computations, not only can the average number of schools with any characteristic be estimated, but using the standard errors, a confidence interval can be constructed about that estimate so that the size of error can be gauged.

*Computing Weighted School Means.* Projected means for percentages or counts of characteristics of U.S. public schools operating grades 1-6 are computed by weighting each sampling-cell mean according to the proportion of population schools in the cell. This procedure results in a systematic expansion of the sample size to that of the population that maintains the cell relationships existing in the population. The formula for the weighted mean computed from the 84 occupied sample cells is as follows:

$$\overline{X}_s = \frac{1}{T}\left(\sum_{i=1}^{84} N_i \, M_{X_i}\right)$$

where:

$\overline{X}_s$ = weighted mean computed from the sample

$T$ = population size (62,534 schools)

$N_i$ = number of population schools in cell i

$M_{X_i}$ = mean of the variable for the sample schools in cell i

Categorical school characteristics do not have meaningful means, of course, so their projections are made as exact analogs of the formula provided above, with frequencies of observations taking the place of the observed cell means.

For projections from the Respondent Sample and the Representative Sample, the weighting procedure was performed in parallel, with the Representative Sample included in the Respondent Sample. This resulted in a slight amount of overlap in the samples and created some non-independence in the statistical tests that were used to investigate the significance of differences in the projected means. Thus, the statistical tests are slightly under-calculated because the standard errors of the differences were not reduced by the existing, but unknown, amount of correlation between the two samples. The amount of overlap is so small, however, that we do not believe it significantly changes the values or the interpretations of the tests.

*Computing Standard Errors.* The standard error of each projected mean is computed using a formula adapted from Cochran (1963). This formula is as follows:

$$\sigma_{\overline{X}_s} = \frac{1}{T}\left[\sum_{i=1}^{84} \frac{N_i}{n_i}\left(N_i - n_i\right)\left(\tilde{\sigma}^{2}_{X_i}\right)\right]^{1/2}$$

where, in addition to the previous definitions:

$n_i$ = number of sample schools in cell i

$\sigma_{\bar{X}_s}$ = standard error of the weighted mean

$\tilde{\sigma}^2_{X_i}$ = estimated population variance of variable X in cell i. For the parallel projections reported in Chapter VII, this estimate was always taken from the Respondent Sample, since it consistently provided the best population estimate for the variables from the Principal Questionnaire.

*The Cell Weights for Projecting School and Student Characteristics.* Table IV-17 provides the total number of schools and students approximated for each cell, based on a population of 62,534 schools and 21,041,303 students. The numbers of schools in the cells provide the $N_i$ in the formulas above, while the numbers of students were used in the development of cell population counts by grade in the formulas to follow.

**Projecting Student Characteristics**

The initial student data for each school in the population came from the MDR Data Tape, which provided only the total school enrollment along with grade range. Eighty-two percent of the schools in the population had grades outside the 1-6 range. For such schools, the number of students in grades 1-6 was approximated by multiplying the school enrollment by a prorating fraction that assumed equal distribution across grades. These approximations were combined with the data for the 18 percent of the schools whose enrollment was completely contained in the 1-6 grade range to produce the student cell data shown in Table IV-17.

A refinement of Table IV-17 was achieved by using the more precise data available from the Respondent Sample of 4,750 schools to modify the cell estimates. The refinement is based on the following equation applied to each cell:

$$\hat{N}_{i.} = A\left(\frac{B}{C}\right)$$

where A is the population cell count shown in Table IV-17, B is the sample count obtained from the cell's schools in the Respondent Sample survey, and C is the MDR Data Tape approximation for those schools. The MDR Data Tape did not allow the population cell approximations to be broken down by grade. However, we were able to accomplish such a breakdown by computing the proportion of students within grades in the total Respondent Sample and then extending the proportions to the refined cell estimates described above.

### Table IV-17

### Numbers of Schools and Students in Each Population Cell Used for Weighting Sample Projections

| Cell | Schools | Students | Cell | Schools | Students | Cell | Schools | Students |
|---|---|---|---|---|---|---|---|---|
| 011 | 149 | 18,968 | 322 | 1,136 | 435,879 | 633 | 365 | 140,851 |
| 012 | 514 | 91,736 | 323 | 196 | 82,479 | | | |
| 013 | 1,722 | 423,821 | 331 | 1,095 | 476,570 | 711 | 622 | 59,694 |
| 021 | 0 | 0 | 332 | 1,524 | 727,967 | 712 | 917 | 100,874 |
| 022 | 283 | 82,993 | 333 | 423 | 213,726 | 713 | 667 | 98,069 |
| 023 | 1,369 | 445,240 | | | | 721 | 0 | 0 |
| 031 | 101 | 33,644 | 411 | 436 | 92,046 | 722 | 140 | 47,021 |
| 032 | 194 | 55,756 | 412 | 1,724 | 404,537 | 723 | 374 | 132,895 |
| 033 | 113 | 40,626 | 413 | 5,122 | 1,474,748 | 731 | 0 | 0 |
| | | | 421 | 38 | 8,301 | 732 | 195 | 84,691 |
| 111 | 33 | 8,572 | 422 | 263 | 82,330 | 733 | 340 | 138,160 |
| 112 | 354 | 115,304 | 423 | 3,379 | 1,241,472 | | | |
| 113 | 1,884 | 649,943 | 431 | 32 | 11,875 | 811 | 435 | 118,433 |
| 121 | 36 | 16,022 | 432 | 1,679 | 836,535 | 812 | 650 | 149,365 |
| 122 | 255 | 102,097 | 433 | 1,025 | 390,719 | 813 | 833 | 225,128 |
| 123 | 1,517 | 704,190 | | | | 821 | 109 | 37,044 |
| 131 | 603 | 416,750 | 511 | 2,171 | 497,755 | 822 | 628 | 249,243 |
| 132 | 213 | 105,709 | 512 | 812 | 195,281 | 823 | 1,388 | 579,160 |
| 133 | 307 | 176,400 | 513 | 409 | 119,113 | 831 | 116 | 57,150 |
| | | | 521 | 920 | 341,562 | 832 | 1,111 | 568,126 |
| 211 | 364 | 89,178 | 522 | 372 | 141,797 | 833 | 903 | 428,289 |
| 212 | 580 | 154,940 | 523 | 334 | 160,521 | | | |
| 213 | 1,085 | 308,063 | 531 | 504 | 249,308 | 911 | 96 | 19,101 |
| 221 | 673 | 174,826 | 532 | 1,133 | 545,853 | 912 | 625 | 105,190 |
| 222 | 823 | 240,666 | 533 | 288 | 163,425 | 913 | 737 | 160,615 |
| 223 | 1,172 | 403,207 | | | | 921 | 0 | 0 |
| 231 | 398 | 192,348 | 611 | 448 | 80,145 | 922 | 100 | 31,345 |
| 232 | 574 | 260,452 | 612 | 1,183 | 212,930 | 923 | 579 | 205,877 |
| 233 | 941 | 399,362 | 613 | 1,352 | 271,330 | 931 | 0 | 0 |
| | | | 621 | 28 | 8,024 | 932 | 0 | 0 |
| 311 | 2,038 | 671,215 | 622 | 69 | 21,587 | 933 | 506 | 172,277 |
| 312 | 438 | 154,983 | 623 | 632 | 207,351 | | | |
| 313 | 53 | 19,766 | 631 | 140 | 43,199 | | | |
| 321 | 2,205 | 763,077 | 632 | 240 | 74,486 | Total | 62,534 | 21,041,303 |

*Computing Weighted Student Means.* Projected student means are computed according to an established procedure for making population estimates based on stratified weighting of cells, wherein the data for each cell are obtained from either a one-stage or a two-stage cluster sampling of students. The one-stage approach is used when projections are made from exhaustive student testing within the 243 schools of the Representative Sample, while the two-stage approach is required from the 15,000-student sub-sample systematically derived from the Representative Sample.

For both the one-stage and two-stage projections, the formula for the estimated student population mean for grade j, computed from the 84 occupied cells of the SES sampling matrix, is as follows:

$$\bar{\bar{Y}}_j = \frac{\sum_{i=1}^{84} M_{ij} N_{ij} \bar{Y}_{ij}}{\sum_{i=1}^{84} M_{ij} N_{ij}}$$

where $\bar{\bar{Y}}_j$ = projected student population mean of variable Y for grade j,

$M_{ij}$ = average number of students per school in grade j in population cell i,

$N_{ij}$ = number of schools with grade j in population cell i,

$\bar{Y}_{ij} = \dfrac{\sum_k m_{ijk} \bar{y}_{ijk}}{\sum_k m_{ijk}}$ = projected cell mean estimate of variable Y,

$m_{ijk}$ = number of students in school k and grade j for sample cell i, and

$\bar{y}_{ijk}$ = observed mean for school k and grade j for sample cell i.

The $M_{ij} N_{ij}$ product used to weight the mean cell estimates in the first formula above corresponds to the number of students in each grade in each population cell. The second formula above is used to project the cell mean estimate from the sample cell data and reflects the generally preferred alternative to unweighted school-mean averaging to obtain this type of projection. The preceding formulation can be applied to population percentage estimates for categorical variables as well as means for quantitative variables.

*Computing Standard Errors.* The standard error of each projected mean calculated by the procedures described above can be approximated by formulas derived by Lord (1959) from general sampling theory. The basic computational formula is as follows:

$$\sigma_{\bar{\bar{\bar{Y}}}_j} = \frac{1}{\sum_{i=1}^{84} M_{ij} N_{ij}} \left[ \sum_{i=1}^{84} M_{ij}^2 \, N_{ij}^2 \, \sigma^2_{\bar{Y}_{ij}} \right]^{1/2} .$$

where, in addition to the preceding definitions,

$\sigma_{\bar{\bar{\bar{Y}}}_j}$ = standard error of the projected student population mean of variable Y for grade j, and

$\sigma^2_{\bar{Y}_{ij}}$ = estimated variance error of the mean estimate for cell i for the one-stage sample,

= $\frac{1}{n_{ij}} S^2_{\bar{Y}_{ij}} \left[ 1 + RV_{M_{ij}} \right]$, where:

$n_{ij}$ = number of schools with grade j in sample cell i,

$S^2_{\bar{Y}_{ij}}$ = estimated variance of the school means for cell i. This value is obtained from the Representative Sample. A neighborhood cell estimate is used when there are insufficient sample schools in the cell to make an estimate.

$RV_{M_{ij}}$ = relative variance of school grade size in cell i. It is obtained by taking the ratio of the school grade size variance to the square of mean school grade size. The grade enrollment data in the Respondent Sample will be used to provide a stable estimate of this quantity.

The $S^2_{\bar{Y}_{ij}}$ variance estimate in each cell can be calculated from the student mean or the average school mean. The method most applicable to the present study will be chosen after empirical tests on actual first-year data are conducted. The student mean method appears to lead to larger and hence more conservative error estimates.

The Respondent Sample enrollment data for 4,750 schools will be used to ascertain the average number of students in the population for each grade and cell ($M_{ij}$). The number of population schools for each grade and cell ($N_{ij}$) will be approximated by dividing the number of students per grade and cell by the average number of students.

A finite population correction $(1 - \frac{m_{ij} n_{ij}}{M_{ij} N_{ij}})$ for each cell is not included in the above formulation. In the data projections, this factor would merely reduce the standard error by an insignificant amount and therefore will be ignored. For example, the sixth-grade projections would likely span the largest range of such factors, with an estimated 0.72 for a sparsely populated cell (621) that is substantially oversampled, to approximately 1.00 for a densely populated cell (413) that is undersampled. The median factor for this grade is estimated to be 0.99, which would lead to a small overall decrease in the calculated standard error.

For the two-stage sample, the one-stage variance error of the mean cell estimate is supplemented by the following:

$$\sigma^2_{\bar{\bar{Y}}_{ij}} \text{ Supplement} = \frac{1 - f_{ij}}{f_{ij}\, m_{ij}\, n_{ij}} S^2_{w_{Y_{ij}}}$$

where in addition to the preceding definitions:

$f_{ij}$ = proportion of students sampled at the second stage in cell i for grade j,

$m_{ij}$ = average number of total students in the school grade for the sample schools in the cell, and

$S^2_{w_{Y_{ij}}}$ = within-school grade variance of variable Y in the cell.

The $f_{ij}\, m_{ij}\, n_{ij}$ product corresponds to the number of students sampled in the cell at the second stage and acts as a divisor on the proportionally weighted within-school variance to produce the supplemental variance error of the estimated cell mean.

*Estimation of Strata and National Means*. A national mean or a mean for a geographic region, an LEA-size stratum, or a poverty-status level can be obtained by computing a weighted average of the cell mean estimates across the cells of interest. In general,

$$\bar{\bar{\bar{Y}}}_j = \frac{1}{\sum_{i=1}^{c} M_{ij} N_{ij}} \sum_{i=1}^{c} M_{ij} N_{ij} \bar{\bar{Y}}_{ij}$$

where in addition to the preceding definitions:

$\bar{\bar{\bar{Y}}}_j$ = estimated mean across c cells of interest, for grade j.

*Variance Estimates for Strata and National Means.* The estimated variance (error) for the cells of interest is obtained by computing a weighted average of the cell variances across the cells of interest; thus,

$$\sigma^2_{\overset{\equiv}{Y}_j} = \frac{1}{\left(\sum_{i=1}^{c} M_{ij} N_{ij}\right)^2} \sum_{i=1}^{c} M_{ij}^2 N_{ij}^2 \sigma^2_{\overset{\equiv}{Y}_{ij}}$$

where in addition to the preceding definitions:

$\sigma^2_{\overset{\equiv}{Y}_{ij}}$ = estimated variance (error) across c cells of interest for grade j.

*Standard Errors for Strata and National Means.* The standard error for an estimated stratum or national mean is calculated as the square root of the variance described above; that is,

$$\sigma_{\overset{\equiv}{Y}_j} = \left(\sigma^2_{\overset{\equiv}{Y}_j}\right)^{1/2}$$

where:

$\sigma_{\overset{\equiv}{Y}_j}$ = estimated standard error across c cells of interest for grade j.

*Confidence Limits for Strata and National Means.* Conventional 95 percent confidence limits (precision estimates) can be computed for the stratum and national means by adding and subtracting 1.96 of the foregoing standard error to and from the projected value across the cells of interest. Thus,

Lower limit of confidence = $\overset{\equiv}{Y}_j - 1.96\sigma_{\overset{\equiv}{Y}_j}$, and

Upper limit of confidence = $\overset{\equiv}{Y}_j + 1.96\sigma_{\overset{\equiv}{Y}_j}$.

# CHAPTER V. SPECIAL SAMPLES

In addition to the Representative Sample, two special samples were selected for the Sustaining Effects Study to provide assurance that there would be schools with a wide range of important analytic characteristics.

## The Comparison Sample

The Comparison Sample is designed to augment the Representative Sample so that there will be an adequate number of schools with high percentages of poverty children, but without compensatory funding. Such schools will be very important as comparisons in all analyses where the effects of compensatory programs are investigated. Personnel at the USOE Title I Program anticipated that such schools are relatively rare, and therefore might not be selected into the Representative Sample in sufficient numbers to support the comparisons for which they would be critical.

Three methods of obtaining a sample of about 30 of those rare schools were investigated. The first method used nominations of such schools by State Education personnel. By and large, these nominations proved to be of little value; most of the schools nominated had small percentages of poverty children. A second method involved soliciting from each district the names of those schools that, when ranked on poverty indexes, just missed being designated as eligible for Title I. These schools, just above their district cut-off lines, would be optimal schools insofar as they would have more poverty children than others in the district that did not receive Title I services. The method, however, was too difficult to implement within the time available to secure the sample.

The third method, and the one actually employed, involved examining the Principal Questionnaires that had been returned in order to select those schools with high percentages of poor children that reported not receiving any compensatory funds. Responses to two Principal Questionnaire items (see Figure III-1) were jointly examined. Item 6a asked for the percentage of students enrolled in the school that met the district's Title I poverty criteria. One response for Item 7 was that the school received no special funds for compensatory services. By cross-tabulating the responses to these two items, a suitable comparison sample of schools was identified.

The selection process could not be delayed until all the Principal Questionnaires were returned, however, as sufficient time was needed to solicit the schools' participation in the study. At the time of the selection of the Comparison Sample, 3,298 Principal Questionnaires had been returned. Of these, 586 reported that they received no special compensatory funds (Item 7). These 586 schools were further screened to eliminate all that reported fewer than 15 percent of the student body as meeting their district's Title I poverty criteria (Item 6). The 74 schools that met both criteria were screened again to eliminate all schools with random-selection numbers less than four within their sampling cells (if they were later needed as replacements to the Representative Sample, they were transferred to that sample and were then replaced by less poor comparison schools). Fifteen schools were eliminated from consideration for the Comparison Sample so they could remain eligible for selection into the Representative Sample. This left 59 schools in the eligible pool. (It should be noted that each of the 15 schools that were actually selected as part of the Representative Sample will serve comparison purposes in the comparative analyses of later years.)

The 59 schools were then ranked in order of decreasing percentages of students meeting the districts' Title I poverty criteria. The percentages ranged from a high of 90 percent to a low of 15 percent, with a majority of the schools ranging from 15 to 25 percent. The schools were then selected according to their rank, so that schools with the highest poverty percentages were selected first. Near the end of the initial selection of 30, schools were not selected solely on the basis of their poverty status, but also on the basis of their regions. This variation in selection rule, while not much affecting the optimization of poverty, was an attempt to get a wide distribution of geographic region. A similar procedure was used to rank the remaining schools as potential replacements for schools who could not or would not participate. One of the selected comparison schools refused to participate after September 1 and was not replaced.

*Demographic Characteristics.* A total of 29 comparison schools, both original selections and replacements, agreed to participate in the study. To provide some context for the interpretation of the Comparison Sample, the 29 schools were categorized into the three strata of the Representative Sample. The distribution of the sample on each stratum independently is presented in Table V-1 for this descriptive purpose.

Table V-1 indicates that two regions have no schools in the Comparison Sample, and that schools from large and poor districts predominate.

Table V-1

**Distribution of the 29 Schools in the Comparison Sample by Region, Size of LEA, and LEA Poverty Status**

| Region | Number of Schools | Size of LEA | Number of Schools | LEA Poverty Status | Number of Schools |
|---|---|---|---|---|---|
| New England | 1 | Small | 3 | High Poverty | 15 |
| Metropolitan Northeast | 2 | Medium | 9 | Medium Poverty | 9 |
| Mid-Atlantic | 6 | Large | 17 | Low Poverty | 5 |
| Southeast | 5 | | | | |
| North Mideast | 5 | | | | |
| South Central | 5 | | | | |
| Central Midwest | 0 | | | | |
| North Central | 0 | | | | |
| Pacific Southwest | 4 | | | | |
| Pacific Northwest | 1 | | | | |

## The Nominated Sample

The Nominated Sample is designed to augment the Representative Sample so that there will be a wide range of project types. The Nominated Sample includes schools with a variety of instructional approaches and unusual projects that would have only a small chance of occurring in the Representative Sample.

All the programs of the schools selected for the Nominated Sample are aimed at improving the reading and mathematics skills of educationally disadvantaged children in grades 1 through 6. Such programs may have federal, state, local, or private funding, or any combination of these. Projects were selected into the sample primarily on the basis of their degree of promise. However, a broad definition of "promise" was adopted so that a wide range of programs could be selected.

A promising program was defined as a compensatory program that involves the use of new or unusual instructional practices or administration. Thus, a program deemed promising need not be an untested innovative program. The promise of a program might, for example, lie in its organizational administration or in its creative use of spatial arrangements; a promising program might use an unusual combination of instructional approaches, employ staff with unusual qualifications, or use traditional resources in an uncommon fashion. At the other extreme, a promising program might be totally new and different. However, promising projects **are not** dependent on highly unusual or idiosyncratic combinations of circumstances that would make their replication by other schools infeasible.

When possible, the schools considered for the sample were those whose programs were judged successful on the basis of (1) achievement score gains measured by local or standardized criteria, (2) subjective or anecdotal evaluative information that indicated success, and/or (3) evidence of promise.

*Nomination Procedures.* The U.S. Office of Education and SDC solicited nominations of promising projects (schools) from a number of experts in compensatory education, including State Title I Coordinators, the Sustaining Effects Study Advisory Groups, various state education personnel, and members of the Advisory Panel on the Evaluation of the Emergency School Aid Act (ESAA). In addition, the Office of Education Title I exemplary programs, the Right to Read exemplary projects, and the ESAA successful sites were reviewed for possible candidates.

Between September and December 1975, 222 nominations were received. The nominating sources were as follows:

| Nominator | Number of Nominations |
|---|---|
| State Title I Coordinators (12 states) | 43 |
| Title I Panel Members (5) | 15 |
| Miscellaneous: | |
| OE exemplary programs | 45 |
| Right to Read exemplary programs | 62 |
| ESAA successful sites | 15 |
| State compensatory personnel | 16 |
| SDC staff | 21 |
| Other | 5 |

In some cases, a district-wide project was nominated. Because the focus of the Sustaining Effects Study is on individual schools, the identification of a school was accomplished in one of two ways: SDC tried to identify the school that had the greatest percentage of participants and/or in which the district project was best represented; in the cases where such information was not available, SDC asked the project director to select a school.

Demographic and descriptive data were provided by project nominators. In addition, nominated projects received at least one telephone call to verify data and to collect missing information. Special information was available concerning the Title I exemplary programs, the Right to Read exemplary projects, and the ESAA successful sites. The Title I exemplary projects, with the exception of the 1975-76 nominations, had been approved by the OE Dissemination Review Panel. Typically, these projects comply with Title I regulations, and their students average one month's gain for each month of instruction. The Right to Read exemplary projects were identified by the American Institutes for Research (AIR) in a study for the National Right to Read Program. The programs selected by AIR did not have official OE endorsement, but they met certain criteria, namely, they had been in existence for at least a year, they operated at reasonable per-pupil costs, program management and instructional processes were describable, and the programs had available evaluation data. Finally, some special projects participating in SDC's evaluation of ESAA were reviewed. During the 1974-75 school year, 24 elementary schools from the ESAA sample were studied in depth; those projects that were innovative and successful were included for consideration.

*Sample Selection.* Demographic and descriptive information on each project was recorded on a Nomination Form, which provided standardized information for screening and selecting projects for the sample.

The projects to be visited were selected by members of the Sustaining Effects Study's Nominated Projects Advisory Panel, which met in December, 1975. The panel was supplemented by personnel from the Office of Education and from SDC. The SDC staff eliminated 58 of the 222 projects because they did not cover grades within the 1-through-6 span, were not directed toward improving achievement in reading and/or mathematics, or were not aimed at or adaptable to educationally and/or economically disadvantaged students. SDC submitted the nomination forms for the remaining 164 projects to the Advisory Panel, which was asked to select approximately 75 to be visited by SDC staff to (1) verify that the projects were as described on the nomination forms, and (2) determine whether the projects would be able to participate in the study.

*Selection Criteria.* The Advisory Panel reviewed the 164 projects on the basis of seven criteria, which are discussed below in general order of importance.

Overall Unusualness of Project: The basic purpose for selecting projects was to ensure that unusual projects were included in the Sustaining Effects Study. Therefore, projects selected should be sufficiently unusual that it is unlikely that their types would occur in the Representative Sample.

Replicability or Generalizability of Project: Projects should not depend upon a combination of unique circumstances or upon resources that are extremely difficult to obtain, or be of such high cost as to prohibit or seriously limit their implementation in other schools or districts.

Relevance of Projects for Policy Decisions: The nominated projects should provide information that would help meet the analytical objectives of the Sustaining Effects Study. To this end it is necessary for projects to have the following characteristics:

- The compensatory project should cover at least two grades within the 1-through-6 span.
- A relatively large percentage (25 percent minimum) of the students within a single school should participate in the project.
- Children who participate in the project should be similar to non-participating children in the same school or in comparable schools.
- Data collection procedures and instrumentation to be used with the Nominated Sample should be basically the same as those used for the Representative Sample.

Variety of Programs: The sample of nominated projects should represent a variety of programs: some projects that are unusual in the use or mix of facilities, equipment, or materials; some that are unusual in organizational structure; some that are unusual in parent and/or community involvement; some that are unusual in instructional approaches; and some that are unusual in a number of areas.

Curricular Focus: Because most projects focus on reading, attention should be given specifically to the nomination of projects that focus on or include mathematics.

Representativeness of Sample: Obviously a judgmentally-selected sample will not be statistically representative either of the population of schools in the country or of the population of promising projects. However, in terms of the political acceptability of findings and recommendations, it is desirable to include projects that offer a range of student race/ethnicity, geographic region, urbanism, and size of school district.

Effectiveness of Project: It is of prime importance that projects selected for the nominated sample be effective in raising the achievement level of low-achieving students. Almost all schools that were nominated and passed the screening were reputed to have standardized test data to substantiate effectiveness. Unfortunately, it was not possible for the Advisory Panel to use effectiveness as a criterion for selection because standardized test results had been provided on only about a third of the projects.

*Procedures for Project Selection.* In order to select candidate schools, three subpanels were formed, each with representatives from the Advisory Panel, OE, and SDC. Each subpanel worked with about a third of the projects. First, each subpanel elected ten projects that should unequivocally be candidates for the final sample and twenty projects that should be eliminated from consideration. Consensus was achieved by having subpanel members rate each project independently; then, projects were discussed until everyone agreed or a majority vote could be accepted. Next, the top thirty projects (ten from each subpanel) were considered to be in the candidate group. These projects were examined in terms of two of the criteria-variety of innovations and representativeness. Findings from this examination were input to deliberations concerning the secondary selections.

At this point, each subpanel rated the remaining 25 (or so) projects in terms of desirability for inclusion. A three-way breakdown on desirability for inclusion in the sample was used. The list of secondary projects was then given to another subpanel for an independent rating. Project ratings were then negotiated to complete the quota of approximately 75 projects.

The panel finally selected 61 prime and 13 alternate projects; the alternates could be replaced if more innovative projects were found. Panel members agreed that large cities were under-represented in the sample and that SDC should make further attempts to find large-city programs. Several panel members provided the SDC staff with suggestions of projects and/or names of contacts.

Subsequent to the meeting of the panel, several cities were contacted in an attempt to increase the representation of large-city school projects. Nine cities nominated projects that appeared to meet the selection criteria; these were used to replace the nine least unusual back-ups. After the panel meeting, additional nominations were received from five more State Title I Coordinators. Eight projects were considered by SDC staff to be more unusual than the remaining back-ups and were included accordingly. Two more of the original back-ups were eliminated, leaving only two of the original back-ups in the final sample to be visited.

A few additional changes had to be made. One site was eliminated when later contact with the district revealed that only a few students participated in the program; another district requested exclusion; and a site visit could not be scheduled at a third district. Several projects originally rejected by the panel because of incomplete data were placed on the candidate list when additional information indicated that they were worthy of consideration. A total of 83 sites was finally visited by the SDC staff.

*Site Visits.* Letters were sent to the superintendents and principals of the nominated schools, and phone calls were made to the principals and/or project directors of the sites in order to schedule visits. The SDC staff members who conducted the site visits were briefed on the overall design and objectives of the Sustaining Effects Study as well as on the specific purposes of the site visits. Site visitors were given the nomination forms for the sites they were scheduled to visit, and were instructed to verify the information contained on the nomination form and to obtain additional information on the project through observation and informal discussion with project personnel. For each project, site visitors were responsible for:

1. Providing data on the administrative aspects of the nominated projects.
2. Verifying the unusual aspects of the project. This did not involve a judgment of the degree of unusualness; that is, if the nominator said that the project was unusual in parental involvement, it was the site visitor's job to describe briefly the **kind and amount** of parental involvement.

3. Providing a comprehensive and accurate description of the project to be used as a major input for deciding whether or not the project would be invited to participate in the study. The project description would also help determine if changes were required in the regular data collection schedule and instrumentation. Therefore, the project description had to be explicit about the "who, where, when, and how" of the project, and about the relationship of the project to the regular school program.
4. Determining whether there was some compelling reason why the project could not or would not participate in the study. If there was such a reason, details were to be provided.
5. Making a judgment with justification as to whether the project should be included in the study. While the site visitor's opinion of the desirability of including or excluding the project in terms of its unusualness was of interest, there were other factors of equal or greater importance. These include the logistics of the project and the number and mobility of participating students.
6. Identifying problems. Site visitors were asked to identify potential problems in applying our proposed data collection schedule to the project, as well as areas for which our instrumentation may be inadequate.

*Rating and Selecting Sites.* After each visit, site visitors completed a Nominated Site Visit Form detailing the information outlined above. Site visitors completed their responsibility by rating each site as: not to be considered for inclusion in the Nominated Sample (project was not particularly promising; participation in the study would seriously burden the school; project posed serious data collection problems; or project showed little evidence of success); met the requirements for inclusion in the sample, in the opinion of the site visitor; should definitely be included in the sample if there were insufficient sites; and to be considered only in the event that the selected projects numbered considerably fewer than the targeted sample of 45.

*Description of the Nominated Sample.* The procedures for inviting the 45 nominated schools to participate in the Sustaining Effects Study were similar to those used for the schools in the Representative Sample. After the cut-off date for sample replacement, two of the schools indicated that they would not participate. This left a total of 43 schools in the Nominated Sample. To provide a description of this sample, the 43 schools will be described first in terms of their distinctive programs, and second in terms of their demographic characteristics.

Based upon the reports completed by site visitors, school programs were categorized in terms of their dominant unusual features. The categories into which programs were grouped are described below.

Classroom Management Systems: Included in this category are programs that have plans for organizing student assignments so that each child has an assigned activity at all times. Classroom management systems typically: (a) are diagnostic-prescriptive, each activity being related to a diagnosed deficiency in student skill; (b) have a sequence of criterion-referenced objectives with which assignments are made; or (c) use a variety of materials and instructional approaches.

Eclectic: Programs in this category exhibited more than one promising approach; they appeared to use combinations of different materials and instructional methods for different purposes. These programs also included several projects that cut across classes or grades.

Community Involvement: Included in this category are programs with a high degree of parental and community involvement.

Instructional Delivery Systems: Programs in this category are distinguished by having either an unusual source of instruction – such as peer tutoring, CAI, television, or audiovisual equipment – or unusual features of instructional interaction – such as highly interactive approaches or an emphasis on structuring reinforcing contingencies.

Program Management: Included in this category are programs that have unusual organizational structures, i.e., structures of power, authority, responsibility, or communication. For some schools, this means that programs are administered in a less hierarchial fashion than is customary and that low-ranking members of the school organization (or persons not usually a part of the organization) are given unusual authority or responsibility. Other schools were included because of a high degree of internal communication and coordination of school programs.

Indirect Approach: Programs with an indirect approach teach basic skills through activities that focus on something else. Such programs may emphasize the development of motivation, readiness, or self-concept, either as prerequisites or (presumed) sufficient conditions for skill development.

Teacher Training: Programs in this category emphasize the improvement of teacher skills.

Table V-2 presents the number of schools recommended for the Nominated Sample with each type of educational program, and the number of each that participated.

Table V-2

Types of Programs (Unusual Components) for Schools at Two Stages of the Nominated Sample

| Type of Program | Recommended Schools | Participating Schools |
|---|---|---|
| Classroom Management | 12 | 9 |
| Eclectic | 13 | 10 |
| Community Involvement | 7 | 7 |
| Delivery System | 9 | 8 |
| Program Management | 4 | 4 |
| Indirect Approach | 5 | 4 |
| Teacher Training | 1 | 1 |
| Totals | 51 | 43 |

*Demographic Characteristics.* Because the Nominated Sample was not intended to be representative of the population of schools, no statistical projections to the population or tests of representativeness were appropriate for this sample. To provide some additional context for the interpretation of the Nominated Sample, however, the 43 schools were categorized into the three strata of the sampling matrix that had been employed for the selection of the Representative Sample. The distribution of the sample on each stratum independently is presented in Table V-3 for this descriptive purpose.

Table V-3 indicates that the schools in the Nominated Sample come from a wide range of geographic regions; the only region not represented is New England. Schools in large districts and in districts with medium-to-low poverty predominate in the sample.

### The Feed Sample

Because of the longitudinal nature of many of the analytic questions posed for the Sustaining Effects Study, schools with wide ranges of grades, preferably 1-through-6, would provide much critical information. It was impossible, however, to eliminate schools from the Representative Sample that had restricted grade ranges. With the further consideration that restriction of grade range within a school might reflect an important aspect of instructional organization or theory of education, or that it might be the result of a district-wide effort to desegregate, it was expected that the restricted-range schools would provide important variations for the analytic studies.

**Table V-3**

**Distribution of the 43 Schools in the Nominated Sample by Region, Size of LEA, and LEA Poverty Status**

| Region | Number of Schools | Size of LEA | Number of Schools | LEA Poverty Status | Number of Schools |
|---|---|---|---|---|---|
| New England | 0 | Small | 6 | High Poverty | 6 |
| Metropolitan Northeast | 3 | Medium | 14 | Medium Poverty | 22 |
| Mid-Atlantic | 6 | Large | 23 | Low Poverty | 15 |
| Southeast | 4 | | | | |
| North Midwest | 8 | | | | |
| South Central | 3 | | | | |
| Central Midwest | 3 | | | | |
| North Central | 2 | | | | |
| Pacific Southwest | 7 | | | | |
| Pacific Northwest | 7 | | | | |

Since, from the MDR data tape universe, about one-third of the randomly-selected schools were expected to have restricted grade ranges, the Principal Questionnaire included questions about which school(s) fed into or out of the sampled school. For all schools in the Representative Sample for which the addition of one feed-in or feed-out school would capture all the 1-6 students, the associated feed school was also invited into the first-year sample. The Feed Sample would not enter into population projections for the Participation Study, but would provide potentially important analytic variation for all the other parts of the Sustaining Effects Study.

Of the feed schools that were invited to participate in the study, 14 accepted. The 14 feed schools, with their respective associated schools from the Representative Sample, would provide students to the analytic sample that could be easily followed through the course of their elementary careers. The distribution of the 14 feed schools on each stratum of the sampling matrix is presented in Table V-4 to aid in the description of these schools.

Table V-4 indicates that the schools in the Feed Sample are widely distributed over the stratification dimensions of the sampling matrix.

Table V-4

Distribution of the 14 Feed Schools by Region, Size of LEA, and LEA Poverty Status

| Region | Number of Schools | Size of LEA | Number of Schools | LEA Poverty Status | Number of Schools |
|---|---|---|---|---|---|
| New England | 2 | Small | 5 | High Poverty | 4 |
| Metropolitan Northeast | 2 | Medium | 5 | Medium Poverty | 7 |
| Mid-Atlantic | 1 | Large | 4 | Low Poverty | 3 |
| Southeast | 3 | | | | |
| North Midwest | 0 | | | | |
| South Central | 1 | | | | |
| Central Midwest | 1 | | | | |
| North Central | 2 | | | | |
| Pacific Southwest | 2 | | | | |
| Pacific Northwest | 0 | | | | |

# CHAPTER VI. THE COMBINED FIRST-YEAR SAMPLES

The schools participating in the Sustaining Effects Study during its first operational year numbered 329 and came from four conceptually distinct samples. The combined sample was composed of 243 schools from the Representative Sample, 29 schools from the Comparison Sample, 43 schools from the Nominated Sample, and 14 schools from the Feed Sample. This chapter presents a brief description of the combined sample, with an evaluation of its adequacy in meeting some of the purposes for which it was selected.

## Adequacy of the Sample for Supporting Policy Generalizations

Because the acceptance of research findings by policy-makers and the incorporation of the findings into policy decisions has a political aspect, it is important to demonstrate that the first-year sample is capable of representing the complete range of demographic differences within the United States.

*Distribution of Schools Over the Sampling Matrix.* Broad distribution of the schools in the first-year sample over all the dimensions of the sampling matrix demonstrates a wide variation in the representation of regions, population concentrations, and degrees of poverty. Table VI-1 presents the tabulations over each of the dimensions of the sampling matrix for the 329 participating schools.

From Table VI-1 it can be seen that the nation's regions are well represented, with the more populous regions being represented by slightly more schools than the less populous ones. In terms of population-density representation, schools from large districts (therefore from the larger cities) are more heavily represented. Middle-poverty districts are most represented, but the reader should remember that this category is entirely below the median poverty level for all districts. For both district size and poverty level, the sample is well focused on the students who will be able to provide the information necessary to study the sustaining effects of compensatory education.

*Distribution of Schools Among the States.* A second way of evaluating the distribution of the schools in the first-year sample is to inspect their representation of the states of the nation. In Table VI-2, the number of schools in each of the 51 states (the District of Columbia is included) has been tabulated.

It can be seen that only five states are not represented in the first-year sample: Delaware, Montana, Nebraska, New Hampshire, and Vermont. The reader should be assured that these five omissions are largely caused by the random-selection methods and the fact that the five states are sparsely populated, and not by inability or unwillingness of the states to cooperate in the study.

### Table VI-1

### Distribution of the First-Year Sample Over the Dimensions of the Sampling Matrix

| Dimension | Representative Sample | Comparison Sample | Nominated Sample | Feed Sample | Combined Sample |
|---|---|---|---|---|---|
| Geographic Region | | | | | |
| New England | 24 | 1 | 0 | 2 | 27 |
| Metropolitan Northeast | 23 | 2 | 3 | 2 | 30 |
| Mid-Atlantic | 26 | 6 | 6 | 1 | 39 |
| Southeast | 25 | 5 | 4 | 3 | 37 |
| North Midwest | 29 | 5 | 8 | 0 | 42 |
| South Central | 27 | 5 | 3 | 1 | 36 |
| Central Midwest | 27 | 0 | 3 | 1 | 31 |
| North Central | 21 | 0 | 2 | 2 | 25 |
| Pacific Southwest | 24 | 4 | 7 | 2 | 37 |
| Pacific Northwest | 17 | 1 | 7 | 0 | 25 |
| Totals | 243 | 29 | 43 | 14 | 329 |
| LEA Size | | | | | |
| Small District | 88 | 3 | 6 | 5 | 102 |
| Medium District | 80 | 9 | 14 | 5 | 108 |
| Large District | 75 | 17 | 23 | 4 | 119 |
| Totals | 243 | 29 | 43 | 14 | 329 |
| LEA Poverty Level | | | | | |
| High Poverty | 71 | 15 | 6 | 4 | 96 |
| Medium Poverty | 84 | 9 | 22 | 7 | 122 |
| Low Poverty | 88 | 5 | 15 | 3 | 111 |
| Totals | 243 | 29 | 43 | 14 | 329 |

## Sample Adequacy for Supporting Analytic Studies

A second method for evaluating the overall adequacy of the first-year sample is to consider whether the sample contains students and schools with a sufficiently wide range of characteristics so that the critical comparative analyses will be based on reasonably large numbers of cases in each of the groups that are compared. Several characteristics that are critical to the policy questions to be answered by the Sustaining Effects Study are listed below, along with the distribution of the first-year sample schools on those characteristics.

Table VI-2

Distribution of the First-Year Sampling Among the States

| State | Number of Schools | State | Number of Schools | State | Number of Schools |
|---|---|---|---|---|---|
| AL | 4 | KY | 4 | ND | 3 |
| AK | 1 | LA | 12 | OH | 9 |
| AZ | 5 | ME | 7 | OK | 2 |
| AR | 6 | MD | 9 | OR | 13 |
| CA | 28 | MA | 15 | PA | 14 |
| CO | 8 | MI | 5 | RI | 2 |
| CT | 3 | MN | 3 | SC | 4 |
| DE | 0 | MS | 1 | SD | 7 |
| DC | 4 | MO | 17 | TN | 9 |
| FL | 3 | MT | 0 | TX | 15 |
| GA | 6 | NE | 0 | UT | 6 |
| HI | 3 | NV | 1 | VT | 0 |
| ID | 4 | NH | 0 | VA | 8 |
| IL | 11 | NJ | 14 | WA | 7 |
| IN | 9 | NM | 1 | WV | 4 |
| IA | 5 | NY | 16 | WI | 6 |
| KS | 9 | NC | 5 | WY | 1 |

*Adequacy of Dispersion over the Urban-Suburban-Rural Dimension.* The location of students or schools along this dimension may be indirectly important for many reasons. Schools that vary on the dimension may be expected to have different amounts of "richness" available to them, may be able to attract and hold different types of teachers, may work within different district organizations, and may even have students with different characteristics. Although all these are hypothetical, by assuring a dispersion over this dimension, the likelihood of wide variation on each of the related characteristics is increased. Table VI-3 presents the distribution of the 329 schools over seven categories of population density.

Each of the population density categories in Table VI-3 is populated by a number of schools that should be sufficient to provide the needed analytic variability.

## Table VI-3

### Distribution of the First-Year Sample Schools on Urban-Suburban-Rural Dimension

| Population-Density Category | Number of Schools | Percentage of Schools |
|---|---|---|
| City over 500,000 | 39 | 12 |
| City of 200,000–500,000 | 20 | 6 |
| City of 50,000–200,000 | 57 | 17 |
| Suburb of City | 37 | 11 |
| City under 50,000 | 72 | 22 |
| Rural area near city | 29 | 9 |
| Rural area not near city | 75 | 23 |
| Totals | 329 | 100 |

*Representation of the Major Racial/Ethnic Groups.* In order to accurately reflect the educational outcomes that are associated with variations in the racial/ethnic make-up of the student body, and to reflect variations that may occur with different degrees of racial/ethnic mixing, it is important to have schools in the first-year sample that represent those variations. Table VI-4 presents the number of schools in each of eleven categories of racial/ethnic concentration, for each of the five major racial/ethnic groups.

It would be difficult to evaluate the findings in Table VI-4 without consideration of each of the schools individually. In terms of potential needs for analytic variation, however, the table indicates that the first-year sample contains an acceptable range of racial/ethnic concentrations.

*Representation of the Educationally Disadvantaged.* Since, in the final analysis, compensatory-education programs are aimed at students who are not meeting educational/expectations, it is absolutely imperative that the first-year sample provide an adequate number of such students. Without them, or with too few of them, all of the analyses focused on the effects of the programs are doomed. Table VI-5 presents the number and percentage of schools for several categories that reflect the concentration of educational deficit in the student enrollment.

The data in Table VI-5 indicate a wide range of concentration of educational deficit among the schools in the first-year sample. This range will clearly supply the needed number of students with educational deficits, and will also supply a range of school characteristics that may be associated with a high concentration of low achievement among students.

## Table VI-4

Distribution of the First-Year Sample Schools on Concentration of Enrollment in Five Racial/Ethnic Groups

| Percentage of Students Enrolled (Concentration) | Major Racial/Ethnic Groups | | | | |
|---|---|---|---|---|---|
| | American Indian | Asian American | Black | Spanish | White |
| 0 | 242 | 232 | 114 | 167 | 24 |
| 1–10 | 75 | 95 | 103 | 114 | 19 |
| 11–20 | 5 | 0 | 29 | 11 | 3 |
| 21–30 | 2 | 1 | 21 | 11 | 5 |
| 31–40 | 2 | 0 | 8 | 2 | 10 |
| 41–50 | 1 | 1 | 7 | 12 | 17 |
| 51–60 | 0 | 0 | 6 | 3 | 13 |
| 61–70 | 0 | 0 | 6 | 4 | 15 |
| 71–80 | 0 | 0 | 3 | 1 | 32 |
| 81–90 | 0 | 0 | 3 | 3 | 40 |
| 91–100 | 2 | 0 | 29 | 1 | 151 |
| Totals | 329 | 329 | 329 | 329 | 329 |

## Table VI-5

Distribution of the First-Year Sample Schools on Percentage of Students One or More Years Below Grade Level in Reading

| Percentage of Students One Year or More Below Grade Level | Number of Schools | Percentage of Schools |
|---|---|---|
| 0 | 6 | 2 |
| 1-10 | 50 | 15 |
| 11-20 | 66 | 20 |
| 21-30 | 66 | 20 |
| 31-40 | 56 | 17 |
| 41-50 | 29 | 9 |
| 51-60 | 23 | 7 |
| 61-70 | 12 | 4 |
| 71-80 | 11 | 3 |
| 81-90 | 5 | 2 |
| 91-100 | 5 | 2 |
| Totals | 329 | 101 |

*Representation of Poor Students.* Because the allocation of compensatory funds, especially for Title I programs, is largely determined by the poverty level of the school and the district, and because the sample should represent a wide range of poverty, with emphasis upon schools with poor students, the percentage of students who were meeting their district's Title I poverty level or who were eligible to receive free lunches was tabulated. Eleven categories were created on the basis of the larger of the two percentages for each school. The tabulation for the 329 schools in the first-year sample is presented in Table VI-6.

Table VI-6
Distribution of the First-Year Sample Schools on
Percentage of Poor Students

| Percentage of Students Meeting District Poverty Level or Eligible for Free Lunches | Number of Schools | Percentage of Schools |
|---|---|---|
| 0 | 4 | 1 |
| 1-10 | 46 | 14 |
| 11-20 | 65 | 20 |
| 21-30 | 54 | 16 |
| 31-40 | 44 | 13 |
| 41-50 | 28 | 9 |
| 51-60 | 21 | 6 |
| 61-70 | 17 | 5 |
| 71-80 | 19 | 6 |
| 81-90 | 13 | 4 |
| 91-100 | 18 | 6 |
| Totals | 329 | 100 |

The distribution tabulated in Table VI-6 indicates that the first-year schools range over the extremes of concentration of poverty. The influences of this type of concentration will, therefore, be accessible to analysis.

*Dispersion Among Varieties of Compensatory Funds Received by Schools.* As a last check to ascertain that the first-year sample had sufficient numbers of schools receiving and not receiving various compensatory funds, five overlapping categories of funding were created for tabulation purposes. The categories are overlapping, because any school that indicated it received funds from more than one source was counted as receiving funds from each source reported. For that reason, the numbers and percentages in Table VI-7 do not add up to the expected totals.

### Table VI-7
### Distribution of the First-Year Sample Schools on Source of Compensatory Funds Received

| Type of Compensatory Funding | Number of Schools | Percentage of Schools |
|---|---|---|
| ESEA Title I | 214 | 65 |
| Other Federal Funds | 93 | 28 |
| State Funds | 129 | 39 |
| District Funds | 45 | 14 |
| No Compensatory Funds | 73 | 22 |

Table VI-7 indicates that the sample contains an adequate number of schools receiving each of the various types of funding for compensatory programs. The last category, No Compensatory Funds, is critical, as that group supplies the comparison schools for many of the planned analyses.

The data presented in this chapter have indicated that the schools in the first-year sample range widely over all the critical characteristics. This variability within the sample bodes well for the political acceptability of the findings and for the appropriateness and sensitivity of the analytic procedures that disclose them.

# PART II. POPULATION PROJECTIONS OF SCHOOL AND STUDENT CHARACTERISTICS

# CHAPTER VII. DESCRIPTIVE PROJECTIONS FROM THE PRINCIPAL SAMPLE TO THE POPULATION

The projections of the responses to the 4,750 Principal Questionnaires provided this study with the opportunity to make fairly accurate national estimates of characteristics and relationships that have not so far been available. While these projections may have interest to educators, they may also prove very useful to researchers and policy-makers who need accurate ideas of the extent or distribution of school and student characteristics. For purposes of clarity, this chapter is divided into the following sections, dealing with projections of single variables and joint distributions of variables:

- Enrollment, Urbanism, and Achievement
- Compensatory-Education Funds, School Characteristics, and Achievement
- Poverty and Achievement
- Minority Membership and Achievement
- The Characteristics of Public Schools with Grades 1-6
- Three-Year Stability of Student Body
- Summer Schools: Their Availability and Programs

## Enrollment, Urbanism, and Achievement

*School Enrollment.* The total grade 1-6 enrollment projected from the Principal Sample to the population is 20,881,979 students. This projection was obtained by multiplying the projected mean from Table IV-4 by the 62,534 schools on the MDR population data tape. The standard error for this projection, obtained by multiplying the standard error of the mean from Table IV-4 by the same population number, is 181,349 students. The student population, as obtained from the MDR data tape, is 21,041,303 students; this total was obtained by assuming a rectangular distribution of students over grades and then prorating that portion of each school's total enrollment that was in grades 1-6.

The projection of total student enrollment from the Principal Sample agrees very closely with the independent assessment made from the MDR population data tape (see Chapter III). The MDR estimate is less than one standard error from the mean estimated by the Principal Sample. The grade 1-6 total enrollment estimated by NCES for the 1974-75 school year is 20,858,000 (Grant and Lind, 1976), which corresponds even more closely to the projection from the Principal Sample than does the MDR data.

*Grade Enrollment.* Table VII-1 provides a grade-by-grade comparison of NCES enrollment estimates and the corresponding estimates from the Principal Sample.

Table VII-1

Estimated Enrollments (in Thousands) by Grades of U.S. Public Schools

| Grade | 1974-75 NCES Estimate | 1975-76 Projection from Principal Sample | Difference in Estimates |
|---|---|---|---|
| 1 | 3,356 | 3,479 | -123 |
| 2 | 3,259 | 3,260 | - 1 |
| 3 | 3,328 | 3,261 | 67 |
| 4 | 3,508 | 3,309 | 199 |
| 5 | 3,679 | 3,483 | 196 |
| 6 | 3,728 | 3,629 | 99 |
| Totals | 20,858 | 20,421 | 437 |

The individual grade projections from the Principal Sample, shown in Table VII-1, total to 20,421,000, which differs from the previously described grade 1-6 projection from the Principal Sample of 20,881,979. This difference is due to the fact that the former figure represented the total of six individual estimates by grade, each estimate calculated by multiplying the mean projected enrollment for each grade by the actual number of schools that operate the grade. This number was always less than 62,534 (as shown in Table IV-13), which was the multiplier used for the larger projection. The same individual school weights were used in both estimating procedures because the cell population counts by separate grades were not available. We believe that the weights used are very close to the correct weights, but may differ sufficiently for individual sampling cells in that they, too, would contribute to the difference in estimated total enrollments.

*Population Density of School Location.* Each principal indicated a description of the school's location on a rural-suburban-urban dimension. In order to simplify the rating dimension and to eliminate categories with very few schools in them, the original nine categories were condensed into seven. Table VII-2 presents the population projections for the seven types of locations.

The large percentage of schools projected in rural locations should not be misinterpreted to mean that almost 53 percent of the students are rural. The number of rural schools is large, but their enrollments are relatively small. So, while 53 percent of the schools are rural, we could expect a much smaller percentage of the nation's students to be rural.

*School Enrollment and Urbanism.* The cross-tabulations of projected school urbanism, in terms of seven categories of school location on the urban-suburban-rural dimension, with ten categories of school enrollment are presented in Table VII-3. The **gamma** statistic (Mueller, Schuessler, and Costner, 1970) for this cross-tabulation is 0.386, which indicates a fairly strong relationship. (**Gamma** measures the relationship between variables, being the number of concordant pairs minus the number of discordant pairs divided by the total number of pairs. Although **gamma** assumes ordinal-level data, it makes no adjustment for ties,

Table VII-2

Projected Numbers and Percentages of U.S. Public Schools With Grades 1-6 by Population Density of Location

| Location | Projected Frequency | Projected Percentage |
|---|---|---|
| City of over 500,000 | 4,546 | 7.3 |
| City of 200,000–500,000 | 2,428 | 3.9 |
| City of 50,000–200,000 | 6,652 | 10.6 |
| Suburb of city | 9,248 | 14.8 |
| City under 50,000 | 6,596 | 10.5 |
| Rural area near city | 15,541 | 24.9 |
| Rural area not near city | 17,471 | 28.0 |
| Totals | 62,482* | 100.0 |

*The slight difference from 62,534 is due to rounding errors occurring during the individual weighting of sample schools.

proximities, or table size. Its values range from -1.00 to +1.00.) As we consider schools with less urbanism, their median enrollments tend to be smaller. This finding is fairly obvious: generally large schools occur in densely populated areas, and small ones occur in sparsely populated areas.

The entries in the cells of Table VII-3 indicate the percentage of schools of each enrollment category projected for each category of urbanism. Strictly speaking, the calculation of the **gamma** ratio to describe this and a number of other cross-tabulations reported in this chapter, is not entirely appropriate. As an example, the school-location categories can be considered to be approximately ordered along the urban-suburban-rural (or population-density) continuum, but the ordering may not be completely correct for the underlying socio-cultural-demographic dimension of interest. However, the categories derived from the questionnaire items are generally ordered closely enough along this underlying dimension to support our use of **gamma** as an aid in describing the relationship between the two school characteristics.

The **gamma** ratio normally has a sign attached to it to indicate whether concordant or discordant cells predominate in the cross-tabulation. The signs have been deliberately omitted from the statistical descriptions presented here in order to avoid confusion concerning the direction of relationships.

A nominal measurement statistic that is frequently used in frequency analysis, Cramer's **V**, was also used to describe the relationships underlying the cross-tabulations in this chapter. **V** is a modified version of **phi**, suitable for large tables. Dependent only upon nominal-level data, it ranges from 0.00 to 1.00. Larger values merely indicate higher degrees of association, but not the manner or direction of the association. **V** was found to be of limited value as a statistical descriptor in this context and it is reported primarily as a supplement to **gamma** when the occasion seems to warrant it.

Table VII-3
Projected Percentages of Schools by 1–6 Enrollment and Urbanism*

| Urbanism of School | Enrollment in Grades 1–6 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1–100 | 101–200 | 201–300 | 301–400 | 401–500 | 501–600 | 601–700 | 701–800 | 801–1000 | 1001–2800 | Total Counts |
| City of over 500,000 | 0.6 | 5.0 | 13.0 | 20.9 | 15.5 | 13.8 | 9.6 | 8.5 | 9.7 | 3.3 | 4,547 |
| City of 200,000–500,000 | 2.5 | 10.6 | 20.2 | 23.0 | 15.2 | 14.8 | 6.7 | 5.1 | 1.1 | 0.7 | 2,427 |
| City of 50,000–200,000 | 1.6 | 12.7 | 23.5 | 28.2 | 17.1 | 9.2 | 4.8 | 1.7 | 1.0 | 0.2 | 9,652 |
| Suburb of city | 1.3 | 8.2 | 18.5 | 26.6 | 19.6 | 14.0 | 6.5 | 2.5 | 2.4 | 0.4 | 9,247 |
| City under 50,000 | 3.3 | 21.3 | 23.1 | 20.7 | 15.6 | 7.5 | 4.2 | 2.4 | 1.0 | 0.8 | 17,469 |
| Rural area near city | 10.5 | 23.7 | 21.4 | 19.3 | 9.7 | 7.9 | 3.0 | 2.1 | 1.1 | 1.3 | 6,597 |
| Rural area not near city | 26.5 | 30.3 | 17.5 | 12.7 | 5.6 | 2.7 | 1.8 | 1.2 | 1.6 | 0.1 | 15,541 |
| Total counts | 5,703 | 12,088 | 12,524 | 12,724 | 8,256 | 5,152 | 2,721 | 1,608 | 1,258 | 447 | 62,480 |

*Where raw frequencies conceal the underlying relationship, the entries are converted into row percentages so that the relationship is more obvious. The extreme right columns and bottom rows, entitled "Total Counts" are always frequencies instead of percentages. The interested reader can, therefore, compute approximate frequencies within any cell by multiplying the row total by the percentage of concern. All of the statistics computed from the tables have been computed from the raw frequencies, however.

From Table VII-3, it can be seen that 44.9 percent of the schools located in cities over 500,000 population have enrollments exceeding 500 students. This percentage drops to 28.4 for cities of 200,000 to 500,000, 16.9 percent for cities of 50,000 to 200,000, 25.7 percent for suburbs, 15.9 percent for small cities, 15.4 percent for rural areas near cities, and only 7.4 percent for rural areas removed from cities. Despite the relationship observed here, there are some small schools located in urban environments and some large schools located in rural environments. The value of **gamma**, of course, indicates that there would be many exceptions to a perfect relationship.

*School Grade Range and Urbanism.* Four categories of the range of grades provided by schools were created for analysis purposes. The four categories can best be described as complete-range schools, feeders to middle schools, primary schools, and middle schools. Of course, not all schools fit into any one of the categories, as there were almost all possible permutations of grades in schools, including schools with gaps of two or more grades.

The cross-tabulation of school urbanism and type of grade-range of the school, presented in Table VII-4, yields a V statistic of .100, indicating a slight relationship between these variables. Thus, knowing the location of a school on the population-density dimension does not allow one to guess accurately the type of grade span of the school. The main contributors to the V statistic are the small-city, suburban, and rural-near-a-city schools, which have a tendency to have a smaller percentage of 1-6 grade spans.

Table VII-4

Projected Percentages of Schools by Grade Range and Urbanism

| | Grade Range of School | | | | |
|---|---|---|---|---|---|
| Urbanism of School | Complete (All 6 Grades) | Feeder (Mostly 1–5) | Primary (Mostly 1–4) | Middle (Mostly 5–6) | Total Counts |
| City of over 500,000 | 75.5 | 10.1 | 7.0 | 7.3 | 4,547 |
| City of 200,000–500,000 | 66.2 | 16.0 | 10.8 | 7.0 | 2,427 |
| City of 50,000–200,000 | 70.8 | 11.1 | 8.5 | 9.5 | 6,653 |
| Suburb of city | 69.5 | 16.3 | 6.2 | 8.1 | 9,249 |
| City under 50,000 | 57.9 | 16.0 | 12.9 | 13.2 | 17,470 |
| Rural area near city | 63.5 | 11.0 | 10.8 | 14.7 | 6,597 |
| Rural area not near city | 73.7 | 7.2 | 10.5 | 8.6 | 15,541 |
| Total Counts | 41,945 | 7,739 | 6,309 | 6,491 | 62,484 |

There also appears to be some tendency for urban schools and rural schools not near a city to have complete elementary grade spans. In the large cities, this is probably the result of traditional organizations within the district, although the various methods for accomplishing desegregation could have been expected to mitigate this finding. In the purely rural areas, of course, one school generally serves a very wide span of grades simply because of the small number of students to be served.

*Percentage of Students Reading Below Grade Level.* Three categories of student achievement were developed from the principals' responses of percentages of students reading one year or more below grade level. The three categories divided the sample of responses into somewhat unequal thirds, so there was no assumption that the categories would be equal after the sample characteristics were projected to the population. These data were projected to the entire school population in the categories shown in Table VII-5.

The mean percentage of students reading one year or more below level is 25.89, with a standard error of .24 (see Table IV-16). The position of the mean in relation to the distribution indicates that the distribution of schools with low-achieving students is positively skewed; that is, most schools have a small minority of low-achievers, but some few schools have majorities of them.

Table VII-5

Projected Numbers and Percentages of U.S. Public Schools With Grades in the 1-6 Range by Percentage of Students Reading One or More Years Below Grade Level

| Percentage of Students Reading Below Grade Level | Projected Frequency | Projected Percentage |
|---|---|---|
| 0–20% | 31,721 | 50.8 |
| 21–50% | 23,772 | 38.0 |
| 51–100% | 6,988 | 11.2 |
| Totals | 62,481* | 100.0 |

*The slight difference from 62,534 is due to rounding errors occurring during the individual weighting of sample schools.

*Student Achievement and Enrollment.* The **gamma** statistic, computed between enrollment and low-achievement categories of Table VII-6, is .079, indicating a relatively weak relationship between the characteristics. This relationship is best seen from the 51-100% column of Table VII-6, where there is a tendency for the larger schools to have a greater percentage of students reading one year or more below grade level. The trend of percentages down this column is almost monotonic, beginning with 7.7 percent of the small (1-100) schools and ending with 29.2 percent for schools with 801-1,000 enrollment and 23.6 percent for schools with enrollments greater than 1,000.

*Student Achievement and Urbanism.* For the relationship between school urbanism and the incidence of low academic achievement as reflected by the percentage of students in the school who are reading a year or more below grade level, a **gamma** of .045 was observed. On the surface, this suggests a very weak relationship. However, the percentages of schools in Table VII-7 with a high incidence of low-achieving students (51-100% column) suggest a non-linear relationship between the variables, in which the incidence of low achievement is greatest in the large cities and the very rural areas. Such a conclusion is reinforced by the value of the **V** statistic, which is .233.

## Compensatory-Education Funds, School Characteristics, and Achievement

*Funding for Compensatory-Education Services.* Table VII-8 presents the projected frequencies and percentages of schools by different funding sources, according to the types of funds received by each school (reported by the principal) during the 1975-76 school year.

From Table VII-8 it can be seen that 42,156 schools, or 67.5 percent of the population of U.S. public schools with any or all of grades 1-6, received Title I funds during the 1975-76 school year. Official statistics are not yet available on which to compare these projections.

## Table VII-6

## Projected Percentages of Schools With Grades in the 1-6 Range by Low-Achievement Rate and Enrollment

| Enrollment in Grades 1-6 | Percentage of Students Reading One Year or More Below Grade Level | | | Total Counts |
|---|---|---|---|---|
| | 0-20% | 21-50% | 51-100% | |
| 1- 100 | 56.6 | 35.7 | 7.7 | 5,704 |
| 101- 200 | 50.7 | 40.8 | 8.5 | 12,086 |
| 201- 300 | 51.6 | 37.6 | 10.9 | 12,523 |
| 301- 400 | 52.4 | 37.1 | 10.4 | 12,723 |
| 401- 500 | 52.0 | 34.9 | 13.1 | 8,256 |
| 501- 600 | 46.7 | 40.8 | 12.4 | 5,152 |
| 601- 700 | 45.1 | 42.5 | 12.4 | 2,722 |
| 701- 800 | 44.6 | 36.5 | 18.8 | 1,609 |
| 801-1000 | 34.2 | 36.6 | 29.2 | 1,259 |
| 1001-2800 | 37.0 | 39.3 | 23.6 | 448 |
| Total Counts | 31,722 | 23,772 | 6,988 | 62,482 |

## Table VII-7

## Projected Percentages of Schools With Grades in the 1-6 Range by Rate of Low Achievement and Urbanism

| Urbanism of School | Percentage of Students Reading One Year or More Below Grade Level | | | Total Counts |
|---|---|---|---|---|
| | 0-20% | 21-50% | 51-100% | |
| City of over 500,000 | 28.0 | 30.9 | 41.1 | 4,547 |
| City of 200,000-500,000 | 35.2 | 42.4 | 22.4 | 2,427 |
| City of 50,000-200,000 | 48.2 | 37.8 | 14.0 | 6,652 |
| Suburb of city | 68.3 | 28.1 | 3.5 | 9,248 |
| City under 50,000 | 55.3 | 38.4 | 6.3 | 17,470 |
| Rural area near city | 53.8 | 39.8 | 6.3 | 6,597 |
| Rural area not near city | 44.1 | 44.3 | 11.6 | 15,540 |
| Total Counts | 31,721 | 23,772 | 6,988 | 62,481 |

### Table VII-8

### Projected Numbers and Percentages of U.S. Public Schools with Grades in the 1–6 Range by Source of Compensatory Education Funds Received

| Funding Source | Projected Frequency | Projected Percentage |
|---|---|---|
| Title I Funds Only | 16,415 | 26.3 |
| Title I Plus Other Funds | 25,741 | 41.2 |
| Other Compensatory Funds Only | 8,934 | 14.3 |
| No Special Compensatory Funds | 11,392 | 18.2 |
| Totals | 62,482* | 100.0 |

*The slight difference from 62,534 is due to rounding errors occurring during the individual weighting of sample schools.

The four categories of receipt of compensatory funds to which the schools in the Principal Sample were assigned were cross-tabulated with several school characteristics. The four categories of receipt of compensatory funds were manipulated in several ways in efforts to increase our understanding of the relationships. For all the analyses reported in this chapter, the categories are reported in the following order: Only Title I funds received, Title I funds and other funds received, only other compensatory funds received, and no compensatory funds received. When it is useful for the sake of meaning, the first two categories are reversed (this more likely provides a better-ordered dimension of amount of funds received), or the first two categories are combined (indicating that Title I funds were received, and were sometimes augmented from other sources), and are reported in addition to the standard order.

*School Receipt of Compensatory Funds and Enrollment.* The **gamma** computed from the cross-tabulation in Table VII-9 is .076, and the **V** statistic is .079. Neither reversing the order of the first two funding categories nor collapsing them affected the size of either coefficient very much. It seems safe to conclude that the incidence of various types of compensatory funding is not related to the size of schools. The reader is reminded, however, that these statistics refer only to the incidence of funding, and not to the amount of funding or the numbers of children receiving services.

*School Receipt of Compensatory Funds and Urbanism.* The **gamma** for Table VII-10 is .242, which indicates a fair degree of relationship between school location and receipt of compensatory funds. The funding categories are not well ordered at all, so the **V** value of .163 may be a more appropriate descriptor of the true relationship.

## Table VII-9

### Projected Percentages of Schools With Grades in the 1–6 Range by Source of Compensatory Funds Received and Enrollment

| | Compensatory Funding Source | | | | |
|---|---|---|---|---|---|
| Enrollment in Grades 1–6 | Title I Only | Title I and Other | Other Only | No Special Funds | Total Counts |
| 1–100 | 29.7 | 36.3 | 13.3 | 20.7 | 5,704 |
| 101–200 | 31.3 | 44.9 | 12.1 | 11.7 | 12,087 |
| 201–300 | 24.0 | 43.7 | 14.8 | 17.5 | 12,524 |
| 301–400 | 27.0 | 38.5 | 14.6 | 19.8 | 12,724 |
| 401–500 | 22.4 | 39.1 | 13.9 | 24.5 | 8,254 |
| 501–600 | 22.5 | 41.0 | 17.6 | 18.9 | 5,151 |
| 601–700 | 24.5 | 39.1 | 17.6 | 18.7 | 2,722 |
| 701–800 | 32.6 | 37.2 | 15.9 | 14.2 | 1,609 |
| 801–1000 | 19.8 | 50.7 | 10.6 | 18.9 | 1,258 |
| 1001–2800 | 7.8 | 52.1 | 17.5 | 22.6 | 447 |
| Total Counts | 16,415 | 25,740 | 8,934 | 11,391 | 62,480 |

## Table VII-10

### Projected Percentages of Schools With Grades in the 1–6 Range by Source of Compensatory Funds Received and Urbanism

| | Compensatory Funding Source | | | | |
|---|---|---|---|---|---|
| Urbanism of School | Title I Only | Title I and Other | Other Only | No Special Funds | Total Counts |
| City of over 500,000 | 17.1 | 39.5 | 18.7 | 24.7 | 4,546 |
| City of 200,000–500,000 | 24.3 | 24.9 | 24.7 | 26.1 | 2,428 |
| City of 50,000–200,000 | 18.7 | 29.8 | 19.8 | 31.7 | 6,652 |
| Suburb of city | 21.0 | 30.5 | 19.8 | 28.7 | 9,248 |
| City under 50,000 | 27.3 | 45.4 | 13.4 | 13.8 | 17,471 |
| Rural area near city | 28.9 | 47.9 | 12.5 | 10.8 | 6,596 |
| Rural area not near city | 33.3 | 48.0 | 7.5 | 11.2 | 15,540 |
| Total Counts | 16,416 | 25,740 | 8,934 | 11,391 | 62,481 |

In an effort to simplify Table VII-10 and to put the funding categories in a better order, the left-most two columns of frequencies were combined. When the columns were combined, the **gamma**, now a more appropriate statistic, equaled .329. From either cross-tabulation, it is apparent that Title I funding is more commonly received by schools in small-city and rural areas, and that "No Special Funds" is more likely to characterize urban schools.

To interpret this cross-tabulation properly, two important facts must be kept in mind. First, the Principal Questionnaire did not ask **how much funding** was received, but whether funds were received. Therefore, while more small-city and rural schools received Title I funds, they may or may not have received more funds. Second, since schools in the urban categories tend to be larger (see Table VII-3) when fewer such schools are receiving funds, they may or may not be receiving funds for fewer children. It seems quite likely that a cursory interpretation of Table VII-10 can be misleading, and that, in fact, **more funds** may actually serve **more students** in the urban categories than in the small-city and rural categories. This last conclusion is conjecture only, but should warn the reader against too simple an interpretation of cross-tabulation findings such as those presented in Table VII-10.

On the other hand, since schools in small-city and rural areas are more likely to receive some Title I funds, even though the greatest poverty and low achievement occurs in rural and large-city areas, it seems reasonable to conclude that children for whom Title I services were designed, but who are not receiving them, are most likely to reside in large cities.

*School Receipt of Compensatory Funds and Grade Range.* The type of compensatory funds received by the school is cross-tabulated with school grade span in Table VII-11. The **gamma** computed from this table is .073 and the **V** is .054. Neither reversing the first two columns of frequencies, nor combining them, significantly altered either of the two coefficients. These indexes indicate that no strong relationship exists between type of funding and the grades served by the schools. The compensatory funds do not seem to be channeled, by and large, into particular types of schools according to their grade spans.

Table VII-11

Projected Percentages of Schools With Grades in the 1-6 Range by Source of Compensatory Funds Received and Range of Grades Provided

| | Compensatory Funding Source | | | | |
|---|---|---|---|---|---|
| Grade Range of School | Title I Only | Title I and Other | Other Only | No Special Funds | Total Counts |
| Complete (all 6 grades) | 25.7 | 40.2 | 14.6 | 19.5 | 41,943 |
| Feeder (mostly 1-5) | 25.1 | 39.3 | 14.6 | 21.1 | 7,738 |
| Primary (mostly 1-4) | 28.4 | 49.7 | 11.1 | 10.8 | 6,309 |
| Middle (mostly 5-6) | 29.2 | 41.4 | 15.3 | 14.1 | 6,490 |
| Total Counts | 16,414 | 25,740 | 8,934 | 11,391 | 62,480 |

*School Receipt of Compensatory Funds and Incidence of Combined Grades.* A **gamma** of .142 was computed from the cross-tabulation of type of compensatory funds received and incidence of combined grades within classrooms, as presented in Table VII-12. When the two Title I fund categories are combined, the **gamma** is increased to .200. This indicates a slight relationship between these two characteristics; schools that receive Title I funds tend not to have classrooms with combined grades. This finding may be mediated by the fact that smaller schools are more likely to receive Title I funds, or it may be caused by particular regulations, or interpretations of regulations, that make the implementation of some aspect of the Title I instructional program easier or better when classrooms are not composed of students from several grades.

Table VII-12

Projected Percentages of Schools With Grades in the 1-6 Range by Source of Compensatory Funds Received and Incidence of Combined-Grade Classrooms

| | Compensatory Funding Source | | | | |
|---|---|---|---|---|---|
| **Incidence of Classrooms With Combined Grades** | **Title I Only** | **Title I and Other** | **Other Only** | **No Special Funds** | **Total Counts** |
| None | 61.3 | 60.6 | 53.1 | 48.5 | 35,964 |
| Some | 38.7 | 39.4 | 46.9 | 51.5 | 26,535 |
| Total Counts | 16,414 | 25,740 | 8,934 | 11,391 | 62,479 |

*School Receipt of Compensatory Funds and Poverty Level of Students.* The level of student poverty was gauged from principals' responses to questions concerning the percentage of students meeting the district's Title I poverty criterion or the percentage of students eligible for free lunches. The distribution of percentage responses from the Principal Sample was divided, for purposes of cross-tabulation, into three meaningful categories that provided not too unequal partitions. The cross-tabulation of student poverty level and school receipt of compensatory funds is presented in Table VII-13. The **gamma** computed from this table is .355. When the two leftmost funding categories are combined, to achieve a more nearly ordinal scale, the **gamma** is increased to .571, indicating a strong relationship between the two characteristics. Among schools in the poorest category, 4.8 percent receive no funds; 5.1 percent receive funds that are not Title I; and 90.1 percent receive Title I funds, often along with other funds. By contrast, among the least poor schools, 27.8 percent receive no special funds; 19.0 percent receive compensatory funds that are not Title I; and 53.2 percent receive Title I funds, often in conjunction with other funds. The relationship is clear and strong: as the poverty level of the school increases, so does the incidence of receipt of Title I compensatory funds. This finding is parallel to the district-level findings reported by the Congressional Budget Office (1977).

### Table VII-13

### Projected Percentages of Schools With Grades in the 1-6 Range by Student Poverty Level and Source of Compensatory Funds Received

| | Compensatory Funding Source | | | | |
|---|---|---|---|---|---|
| Percentage of Poverty Students | Title I Only | Title I and Other | Other Only | No Special Funds | Total Counts |
| 0–20% | 22.2 | 31.0 | 19.0 | 27.8 | 32,269 |
| 21–50% | 30.3 | 48.9 | 11.3 | 9.5 | 20,164 |
| 51–100% | 31.5 | 58.6 | 5.1 | 4.8 | 10,064 |
| Total Counts | 16,415 | 25,749 | 8,934 | 11,391 | 62,479 |

*School Receipt of Compensatory Funds and Minority Concentration.* The **V** statistic based on the cross-tabulation in Table VII-14 is .094, indicating a very weak relationship between receipt of funds and minority concentration. When the first two categories of funding are combined into a category that might be called "Title I and Title I With Other Funding," the funding continuum becomes more ordered, and the **gamma** statistic computed from the reduced cross-tabulation is .228. This stronger relationship is what would be expected: Increased minority enrollment is related to both increased poverty and lower achievement levels. Title I compensatory funds and most other compensatory funds are targeted at schools with children who are poor and low-achieving. In light of the very strong observed relationships of minority concentration to poverty and low achievement, it is surprising that the relationship between receipt of compensatory funds and minority concentration is not higher. At the student level, the National Institute of Education (1976) reports that 54 percent of compensatory-education students are White, while 75 percent of the total enrollment is White; 34 percent are Black, while 19 percent of total enrollment is Black; and 10 percent is Spanish surnamed, compared to 5 percent of the total enrollment.

The percentage of schools funded by Title I jointly with other sources tends to increase with minority concentration, but this trend does not apply for purely Title I funding and non-Title I funding where the incidence of low-minority schools is as great as, or greater than, that for high-minority schools. These results appear to be tied in with the school urbanism and size relationships for Title I funding as described in Tables VII-9 and VII-10. The reader should once again be cautioned that in interpreting this finding the **amount** of compensatory funds was not considered.

*School Receipt of Compensatory Funds and Educational Achievement.* The National Institute of Education (1976) reports that districts commonly provide Title I services only to those students who are at least one year below grade level, thereby serving an average of 57 percent of the students in target schools judged to be in need of Title I services. The incidence of school receipt of types of compensatory funds was independently cross-tabulated

Table VII-14

Projected Percentages of Schools With Grades in the 1-6 Range by Source of Compensatory Funds Received and Minority Concentration

| | Compensatory Funding Source | | | | |
|---|---|---|---|---|---|
| Percentage of Minority Students | Title I Only | Title I and Other | Other Only | No Special Funds | Total Counts |
| 0–19% | 26.9 | 37.7 | 14.9 | 20.6 | 42,734 |
| 20–49% | 22.3 | 42.6 | 16.8 | 18.3 | 10,221 |
| 50–79% | 26.0 | 54.7 | 11.4 | 7.9 | 4,525 |
| 80–100% | 29.5 | 56.0 | 7.0 | 7.5 | 5,001 |
| Total Counts | 16,415 | 25,740 | 8,935 | 11,391 | 62,481 |

with achievement level resulting in Table VII-15. The **V** computed from this table is .140. When the two leftmost funding categories are combined, so that a more ordered scale results, the **gamma** coefficient is .347. This moderate coefficient indicates that as the percentage of low-achieving students increases, it is more likely that Title I funds will be received by the school, and less likely that either non-Title I funds or no funds will be received. This result is particularly interesting, because it indicates that when a school receives funds that are not Title I, the receipt of those funds seems not to be dependent upon concentrations of students reading a year or more below grade level. This phenomenon could be explained if the other compensatory funds (federal, state, and district) were used to provide compensatory services to schools that just missed being included in the Title I allocation formulas, or (less likely) if the funds were allocated to schools on some basis other than low achievement.

Table VII-15

Projected Percentage of Schools With Grades in the 1-6 Range by Source of Compensatory Funds Received and Rate of Low Achievement

| | Compensatory Funding Source | | | | |
|---|---|---|---|---|---|
| Percentage of Students Reading One Year or More Below Grade Level | Title I Only | Title I and Other | Other Only | No Special Funds | Total Counts |
| 0–20% | 23.6 | 35.6 | 16.8 | 24.0 | 31,721 |
| 21–50% | 28.7 | 44.8 | 12.6 | 13.8 | 23,771 |
| 51–100% | 29.9 | 54.4 | 8.7 | 6.9 | 6,988 |
| Total Counts | 16,414 | 25,741 | 8,934 | 11,391 | 62,480 |

*School Receipt of Compensatory Funds and Three-Year Stability of Student Body.* Table VII-16 presents the cross-tabulation of types of compensatory funds received by stability of the student body of the schools. A **gamma** of .124 was computed for the relationship between these two characteristics, indicating only a slight relationship. Reversing and combining the two Title I categories did not significantly change the degree of the relationship. Title I schools are characterized as having slightly more stable student bodies than schools not receiving Title I funds or schools receiving no compensatory funds.

This is an unexpected finding, since receipt of Title I funds is so highly related to poverty level, minority concentration, and low achievement, and each of these characteristics is related to low three-year stability of student body. It would logically follow that receipt of Title I funds would be relatively more common among schools in the low-stability category. A possible explanation for this seeming anomaly is that Title I funds tend to be received more by schools in small cities and urban areas (Table VII-10), which tend to be smaller schools (Table VII-3), and smaller schools tend to have higher student-body stability (Table VII-38). The relationship between school location and student-body stability (Table VII-39) shows this even more directly. Regardless of the reasons for this unexpected finding, it seems reasonably safe to say that Title I funds could be directed more to poor and low-achieving students (and also, indirectly, to minority students) if student-body stability, taking grade-span into account, were somehow considered in the school-allocation formula. Such a plan could, however, meet with some disapproval from representatives of schools and districts in small cities and rural areas.

Table VII-16

Projected Percentages of Schools With Grades in the 1-6 Range by Source of Compensatory Funds Received and Stability of Student Body

| | Compensatory Funding Source | | | | |
|---|---|---|---|---|---|
| Percentage of Students Who Remain in the School for Three Years | Title I Only | Title I and Other | Other Only | No Special Funds | Total Counts |
| 0–60% | 14.0 | 18.0 | 19.2 | 19.5 | 10,884 |
| 61–80% | 20.3 | 22.6 | 26.3 | 27.4 | 14,625 |
| 81–100% | 65.6 | 59.4 | 54.5 | 53.1 | 36,970 |
| Total Counts | 16,414 | 25,739 | 8,934 | 11,392 | 62,479 |

## Poverty and Achievement

*Poverty of Students.* A student's eligibility for Title I services depends not only on his/her low achievement, but also upon the general poverty of the school attended, the district, the county, and even the state. The nature of the allocation formulas inevitably leads to some disparity between the students who are ultimately designated and those who were originally intended to be recipients when the legislation was drafted. According to survey findings by the National Institute of Education (1976), Title I districts use a wide variety of measures of poverty in determining school eligibility for Title I. Over 67 percent of the districts are reported to use more than one source of information, many of them without combining the information in a specific formula. At the school level, the Principal Questionnaire specified eligibility to be interpreted in terms of the student's poverty only.

Using this restricted definition of eligibility, an estimate was obtained from each principal of the percentage of students in the school who met the district's Title I poverty criterion. If the principal had difficulty in obtaining such an estimate, he or she was allowed to substitute the percentage of students eligible to receive free lunches. The analysis presented in Table VII-17 reflects a mixture of these two interrelated criteria of poverty. The data were projected to the entire school population and classified into the categories shown in Table VII-17.

Table VII-17

Projected Numbers and Percentages of U.S. Public Schools With Grades in the 1-6 Range by Percentage of Poverty Students

| Percentage of Students Eligible for Title I or for Free Lunches | Projected Frequency | Projected Percentage |
|---|---|---|
| 0–20% | 32,270 | 51.6 |
| 21–50% | 20,165 | 32.3 |
| 51–100% | 10,046 | 16.1 |
| Totals | 62,481* | 100.0 |

*The slight difference from 62,534 is due to rounding errors occurring during the individual weighting of sample schools.

The mean percentage of students reported as being poor is 28.39, which was obtained by dividing the mean number of students eligible by the mean school enrollment, both numbers coming from Table IV-13. These data indicate that, like the low-achievement percentage, the poverty percentage is distributed over the population's schools with a positive skew; most schools have small percentages of poor students and fewer have very large percentages.

*Student Poverty Level and Enrollment.* A **gamma** of only .005 was obtained from the cross-tabulation presented in Table VII-18. Although **gamma** indicates practically no relationship, inspection of the fourth column of Table VII-18 indicates an almost monotonic trend of increasing poverty with increasing school size. The percentage of schools in the high-poverty

Table VII-18

Projected Percentages of Schools by Student Poverty Level and Enrollment

| | Percentage of Poverty Students | | | |
|---|---|---|---|---|
| Enrollment in Grades 1-6 | 0–20% | 21–50% | 51–100% | Total Counts |
| 1–100 | 48.4 | 36.8 | 14.8 | 5,703 |
| 101–200 | 49.3 | 36.0 | 14.8 | 12,087 |
| 201–300 | 52.3 | 32.2 | 15.5 | 12,524 |
| 301–400 | 54.3 | 31.4 | 14.3 | 12,723 |
| 401–500 | 55.8 | 28.0 | 16.1 | 8,255 |
| 501–600 | 52.3 | 31.7 | 16.0 | 5,152 |
| 601–700 | 51.9 | 27.8 | 20.3 | 2,722 |
| 701–800 | 43.7 | 34.4 | 21.9 | 1,608 |
| 801–1000 | 38.3 | 28.1 | 33.6 | 1,258 |
| 1001–2800 | 42.5 | 18.4 | 39.1 | 447 |
| Total Counts | 32,270 | 20,163 | 10,046 | 62,479 |

category among the smallest schools is only 14.8, but this rises to 39.1 for the largest schools. This trend is based upon a relatively small portion (16.1 percent) of universe schools, and for this reason is not reflected in the **gamma** statistic that reflects the relationship across all schools.

*Student Poverty Level and Urbanism.* The cross-tabulation of school location and level of student poverty in the school is presented in Table VII-19. A **gamma** of .006 indicates essentially no relationship between these two variables. It should be noted, however, that the percentages in Table VII-19 do indicate some interesting associations between the two variables. The percentage of schools with high concentrations of poor students (51-100% column) decreases from a high of 48.9 for large cities to 3.9 for suburbs, and then increases again to 18.9 for purely rural areas. The increase in the incidence of heavy poverty resembles that for the incidence of low-achieving students. Both these phenomena may be due to some more basic variable involving socioeconomic and geographic factors. For whatever reasons, these findings reflect the phenomenon that more affluent (and therefore more academically oriented?) families reside in suburban areas. This phenomenon is confirmed by a **V** statistic of .275 that is not reduced by the non-linearity of the relationship.

*Student Poverty and Minority Concentration.* For increased clarity of presentation, the categories of student poverty level were cross-tabulated with minority concentration independently. The cross-tabulation, presented in Table VII-20, resulted in a **gamma** of .792, as compared with .707 for achievement and minority concentration. From these data, it can be

Table VII-19

Projected Percentages of Schools With Grades in the 1-6 Range by Student Poverty Level and Urbanism

| Urbanism of School | Percentage of Poverty Students 0–20% | 21–50% | 51–100% | Total Counts |
|---|---|---|---|---|
| City of over 500,000 | 23.6 | 27.5 | 48.9 | 4,547 |
| City of 200,000–500,000 | 36.3 | 32.0 | 31.7 | 2,428 |
| City of 50,000–200,000 | 47.9 | 33.9 | 18.2 | 6,652 |
| Suburb of city | 82.4 | 13.7 | 3.9 | 9,248 |
| City under 50,000 | 53.6 | 34.7 | 11.6 | 17,470 |
| Rural area near city | 61.1 | 31.2 | 7.7 | 6,596 |
| Rural area not near city | 39.3 | 41.8 | 18.9 | 15,541 |
| Total Counts | 32,270 | 20,165 | 10,047 | 62,482 |

Table VII-20

Projected Percentages of Schools With Grades in the 1-6 Range by Student Poverty Level and Minority Concentration

| Percentage of Minority Students | Percentage of Poverty Students 0-20% | 21-50% | 51-100% | Total Counts |
|---|---|---|---|---|
| 0-19% | 67.7 | 28.0 | 4.3 | 42,732 |
| 20-49% | 25.7 | 55.9 | 18.4 | 10,220 |
| 50-79% | 9.1 | 32.9 | 58.0 | 4,526 |
| 80-100% | 5.7 | 19.9 | 74.4 | 5,000 |
| Total Counts | 32,268 | 20,165 | 10,045 | 62,478 |

concluded that poverty is more highly related to degree of minority concentration than is low achievement. Among the high minority-concentration schools, 74.4 percent of the schools are in the high poverty category, while only 4.3 percent of the schools in the low minority-concentration category are in the high poverty category.

*Student Poverty and Grade Range.* The cross-tabulation of student poverty with grade span, presented in Table VII-21, yields a **gamma** of 0.086 and a **V** of 0.052, indicating that there is no reliable relationship between these characteristics of schools. Although the data presented indicate no relationship, the reader should keep in mind that the coarse poverty and grade-span categories may be obscuring some trends, especially those that might result from grade-related desegregation procedures.

Table VII-21

Projected Percentages of Schools With Grades in the 1-6 Range by Student Poverty Level and Range of Grades Provided

| Grade Range of School | Percentage of Poverty Students<br>0-20% | <br>21-50% | <br>51-100% | Total Counts |
|---|---|---|---|---|
| Complete (all 6 grades) | 53.2 | 31.4 | 15.4 | 41,942 |
| Feeder (mostly 1-5) | 53.9 | 32.5 | 13.6 | 7,738 |
| Primary (mostly 1-4) | 44.3 | 36.8 | 19.0 | 6,309 |
| Middle (mostly 5-6) | 46.3 | 33.0 | 20.8 | 6,490 |
| Total Counts | 32,270 | 20,164 | 10,045 | 62,479 |

*Student Poverty and Student Achievement.* A **gamma** of 0.754 was computed for the cross-tabulation of student achievement with student poverty that is presented in Table VII-22. Among the lowest-achieving schools, 66.2 percent have high poverty levels, whereas among the highest-achieving schools, 75.1 have the lowest poverty levels.

Table VII-22

Projected Percentages of Schools With Grades in the 1-6 Range by Student Poverty Level and Low-Achievement Rate

| Percentage of Students Reading One Year or More Below Grade Level | Percentage of Poverty Students<br>0-20% | <br>21-50% | <br>51-100% | Total Counts |
|---|---|---|---|---|
| 0-20% | 75.1 | 21.0 | 4.0 | 31,720 |
| 21-50% | 34.0 | 48.5 | 17.5 | 23,770 |
| 51-100% | 5.3 | 28.5 | 66.2 | 6,989 |
| Total Counts | 32,269 | 20,164 | 10,046 | 62,479 |

The high zero-order relationship of 0.754 between student achievement level and student poverty level was studied further by partitioning the cross-tabulation between the two characteristics into the four levels developed for the different funding sources, as presented in Table VII-23.

A conditional **gamma** of 0.757 was observed between the two characteristics for the 16,415 schools projected as funded by Title I alone. This relationship is consistent with that observed when all funds were cross-tabulated. The relative percentages of Title I-only schools falling into the high-poverty category is 70.9 for low achieving schools, 20.1 for medium-achieving schools, and 4.1 for high-achieving schools. These percentages are comparable to those obtained for the zero-order cross-tabulation.

A similar conditional **gamma** of 0.739 was observed for the cross-tabulation of the 25,741 schools projected as funded jointly by Title I and other sources. The relationship here is also consistent with the zero-order relationship. Among the high-poverty schools, 71.6 percent fall into the low-achievement category, 22.8 percent fall into the medium-achievement category; and 6.5 percent fall into the high-achievement category.

### Table VII-23

### Projected Percentages of Schools With Grades in the 1-6 Range by Student Poverty Level, Low-Achievement Rate, and Source of Compensatory Funds Received

| Percentage of Students Reading One Year or More Below Grade Level | Percentage of Poverty Students | | | |
|---|---|---|---|---|
| Source of Compensatory Funds Received by School | 0-20% | 21-50% | 51-100% | Total Counts |
| 0-20% of Students Below Grade-Level | | | | |
| Title I only | 68.7 | 27.2 | 4.1 | 7,498 |
| Title I and other | 64.4 | 29.1 | 6.5 | 11,278 |
| Other funds only | 86.3 | 12.1 | 1.6 | 5,323 |
| No special funds | 89.4 | 8.9 | 1.7 | 7,622 |
| 21-50% of Students Below Grade-Level | | | | |
| Title I only | 28.5 | 51.4 | 20.1 | 6,824 |
| Title I and other | 24.5 | 52.7 | 22.8 | 10,658 |
| Other funds only | 48.1 | 46.2 | 5.7 | 3,004 |
| No special funds | 63.3 | 30.9 | 5.8 | 3,286 |
| 51-100% of Students Below Grade-Level | | | | |
| Title I only | 2.6 | 26.5 | 70.9 | 2,093 |
| Title I and other | 3.1 | 25.3 | 71.6 | 3,805 |
| Other funds only | 17.2 | 40.6 | 42.3 | 606 |
| No special funds | 19.0 | 47.4 | 33.6 | 485 |
| Total Counts | 32,271 | 20,165 | 10,046 | 62,482 |

A conditional **gamma** of 0.760 was obtained from the cross-tabulation of the 8,933 schools projected as funded by non-Title I sources only. Here the percentages of schools in the high-poverty category are very different from the preceding discussions. Only 42.3 percent of such schools are in the lowest achievement category, 5.7 percent in the medium category, and 1.6 percent in the highest achievement category.

A conditional **gamma** of 0.708 was computed from the cross-tabulation of 11,393 schools projected as not receiving any special funds for compensatory education. The percentages of schools in the high-poverty category is comparable to those just reported. As in the previous instance, some rather small marginal totals for some cells may contribute to the apparent strength of the relationship.

The zero-order **gamma** for the relationship between student achievement level and poverty level is 0.754. After controlling for the effects of different sources of compensatory fundings, a first order partial **gamma** of 0.743 was obtained. This indicates that the relationship tends to be consistent across all funding sources, except for the noticeable drop in percentages of schools in all achievement classifications when the non-Title I funding and the non-funded partitions are made.

### Minority Membership and Achievement

One item in the Principal Questionnaire asked for a percentage breakdown of the student enrollment according to racial/ethnic group. The groups were limited to the five most common groups in the nation, with the option for the principal to categorize some students as "other." All "other" responses were apportioned back into the five major groups on the basis of telephone conversations with school personnel, additional comments that were appended to the "other" response, or, as a last resort, on the basis of the HEW/OCR breakdown for the school.

*Racial/Ethnic Composition.* The percentage supplied for each racial/ethnic group was combined with the school's enrollment to compute the number of students falling into each of the groups. The numbers were then projected from the Principal Sample to the entire school population by multiplying the weighted mean number of students in each category by 62,534. The results of this estimation procedure are summarized in Table VII-24.

The accumulated projected total student enrollment of 20,880,727 students shown in Table VII-24 corresponds closely to the previously described estimate from the Principal Sample of 20,881,979 that was projected as a grade 1-6 total.

Actual student enrollment counts or estimates by racial/ethnic groups for grade 1-6 enrollments were not available to compare against the figures shown above. However, HEW/OCR actual and projected data pertaining to 44,646,625 students in grades K-12 for school year 1972-73 were available (U.S. Department of Health, Education, and Welfare, 1972). The percentage comparisons from the HEW/OCR directory (based on a sample that systematically under-represented small districts) and the Principal Sample are shown in Table VII-25.

### Table VII-24

### Projected Numbers and Percentages of Students Enrolled in U.S. Public Schools With Grades in the 1-6 Range by Racial/Ethnic Group

| Racial/Ethnic Group | Projected Frequency | Projected Percentage |
|---|---|---|
| American Indian | 189,478 | 0.91 |
| Asian-American | 198,858 | 0.95 |
| Black | 3,377,461 | 16.17 |
| Spanish Heritage | 1,200,027 | 5.75 |
| White | 15,914,903 | 76.22 |
| Totals | 20,880,727 | 100.00 |

### Table VII-25

### Comparison of Racial/Ethnic Percentages from the HEW/OCR Directory and Projections from the Principal Sample

| Racial/Ethnic Category | HEW/OCR Directory Observed Sample* | HEW/OCR Directory Universe Projection | Principal Sample Projection to Universe | Absolute Deviation HEW/OCR Sample and Principal Sample Projection | Absolute Deviation HEW/OCR Projection and Principal Sample Projection |
|---|---|---|---|---|---|
| American Indian | 0.46 | 0.52 | 0.91 | 0.45 | 0.39 |
| Asian American | 0.55 | 0.52 | 0.95 | 0.40 | 0.43 |
| Black | 16.13 | 15.22 | 16.17 | 0.04 | 0.95 |
| Spanish Heritage | 5.58 | 5.41 | 5.75 | 0.17 | 0.34 |
| White | 77.28 | 78.33 | 76.22 | 1.06 | 2.11 |
| Totals | 100.00 | 100.00 | 100.00 | 2.12 | 4.22 |

*This sample included 40,953,589 students, or 91.7 percent of the public school students in grades K-12, but none in small districts.

Inspection of Table VII-25 shows that the Principal Sample Projections of racial/ethnic percentages in grades 1-6 correspond closely (generally within one percent) to the HEW/OCR observed sample, but differ slightly more from the HEW/OCR universe projections. HEW/OCR projects a larger percentage of white students, perhaps because its population base was grades K-12 and the secondary-school drop-out rate is higher for minority students than it is for white students.

The generally close correspondences are interpreted as evidence that the stratified sample obtained for the Sustaining Effects Study is an effective and accurate representation of the nation's public schools operating grades in the 1-6 range. Also, to the extent that the Representative Sample of 243 schools projects comparable estimates to those generated from the Principal Sample, it too can be viewed as an effective and accurate device for projecting school and student information to the entire population.

For purposes of presenting cross-tabulations that are more meaningful in terms of current concerns, the percentages of various racial/ethnic groups in each school were simplified and combined into an index of total minority enrollment in the school. The percentages of minority enrollment were then divided into four categories, based upon methods used in past research. The categories of minority enrollment were cross-tabulated with several other school characteristics.

*Minority Concentration and Student Achievement.* Table VII-26 presents the cross-tabulation of rates of low student achievement by percentage of minority students enrolled. A gamma of 0.707 was calculated for the cross-tabulation.

Not surprisingly, the cross-tabulation indicates that as the percentage of minority students in a school increases, the percentage of students reading below grade-level also increases. This finding, of course, does not offer any clue to the direction of any causality; the causes

Table VII-26

Projected Percentages of Schools With Grades in the 1-6 Range by Low-Achievement Rate and Minority Concentration

| Percentage of Minority Students | Percentage of Students Reading One Year or More Below Grade Level | | | Total Counts |
|---|---|---|---|---|
| | 0-20% | 21-50% | 51-100% | |
| 0-19% | 64.2 | 32.8 | 3.0 | 42,731 |
| 20-49% | 29.3 | 58.6 | 12.2 | 10,220 |
| 50-79% | 16.4 | 47.7 | 36.0 | 4,525 |
| 80-100% | 11.1 | 32.2 | 56.7 | 5,000 |
| Total Counts | 31,719 | 23,770 | 6,987 | 62,476 |

may be only remotely related to the characteristics under consideration. In order to investigate one possible determiner of this finding, the cross-tabulation was redone with a third variable, student poverty, added. Although it would be technically correct to conclude that we were thus investigating minority concentration and achievement level controlling for poverty, and the statistics are based upon that approach, it is also true that we are examining the three-dimensional cross-tabulation of three coarsely categorized variables. The cross-tabulation of the three characteristics is presented in Table VII-27.

The table is partitioned into three levels of student poverty in order to examine the relationship more closely at each level of poverty. The conditional **gamma** between the two characteristics for the 32,267 schools projected to have relatively low poverty is 0.602. Among these low-poverty schools, only about 0.8 percent with low-minority concentrations are in the very low achievement category, while 11.3 percent of the high-minority are in this category.

### Table VII-27

### Projected Percentages of Schools With Grades in the 1-6 Range by Low Achievement Rate, Minority Concentration, and Student Poverty Level

| Percentage of Poverty Students | Percentage of Students Reading One Year or More Below Grade Level | | | Total Counts |
|---|---|---|---|---|
| | 0-20% | 21-50% | 51-100% | |
| 0-19% Minority | | | | |
| 0-20% of students are poor | 77.2 | 22.0 | 0.8 | 28,948 |
| 21-50% of students are poor | 39.5 | 55.1 | 5.4 | 11,963 |
| 51-100% of students are poor | 21.0 | 57.7 | 21.3 | 1,822 |
| 20-49% Minority | | | | |
| 0-20% of students are poor | 48.4 | 50.2 | 1.4 | 2,624 |
| 21-50% of students are poor | 25.3 | 62.7 | 12.0 | 5,716 |
| 51-100% of students are poor | 14.7 | 57.6 | 27.7 | 1,879 |
| 50-79% Minority | | | | |
| 0-20% of students are poor | 34.1 | 53.0 | 12.9 | 411 |
| 21-50% of students are poor | 19.8 | 60.0 | 20.2 | 1,490 |
| 51-100% of students are poor | 11.6 | 39.9 | 48.5 | 2,624 |
| 80-100% Minority | | | | |
| 0-20% of students are poor | 26.4 | 62.3 | 11.3 | 284 |
| 21-50% of students are poor | 18.8 | 45.1 | 36.1 | 995 |
| 51-100% of students are poor | 7.9 | 26.5 | 65.6 | 3,721 |
| Total Counts | 31,720 | 23,771 | 6,987 | 62,478 |

The conditional **gamma** between minority concentration and rate of low achievement for the 20,164 schools projected to have moderate poverty drops to 0.367. Within these schools, those with the lowest minority concentration have only 5.4 percent of their schools falling in the 51-100 percent low-achievement category, while 36.1 percent of the high-minority schools fall into that category.

The conditional **gamma** between minority concentration and low-achievement rate for the 10,047 schools projected to have high poverty is 0.439. The low minority-concentration group of schools shows 21.3 percent of its schools in the low-achievement category, while 65.6 percent of the high-minority schools fall into this category.

As we partition the cross-tabulation across the poverty dimension, from low to moderate to high poverty, the percentages of schools falling into the very low-achievement category increases at a differential rate for the four minority-concentration categories (see Figure VII-1). This effect can be observed by comparing the vertical spread of the minority-concentration groupings plotted for each poverty level. This finding indicates that the achievement differences among schools with increasing minority concentrations become more and more pronounced as poverty increases.

The zero-order **gamma** for the relationship between minority concentration and student achievement level was 0.707. When we controlled for the effects of poverty, the first-order partial **gamma** was 0.467, indicating that a strong residual relationship between school minority concentration and achievement level still remains after poverty is "accounted for." An example of this "residual" is the conditional **gamma** of 0.602 observed in the low-poverty partition of the minority and achievement cross-tabulation.

### The Characteristics of Public Schools with Grades in the 1-6 Range

*Grade Span.* The grade spans of schools were classified into four educationally meaningful categories, as follows:

- Complete elementary: All grades 1 through 6.
- Feeder elementary: Lacks an upper grade, usually grade 6.
- Primary: Lacks several upper grades, usually 4, 5, and 6.
- Intermediate-Middle: Lacks several lower grades, usually 1, 2, and 3.

This four-group classification seemed to make the most sense for considering the nature of the schools. Table VII-28 describes the projected frequencies of population schools falling into each of the grade-span categories.

*Combined-Grade Operations.* Table VII-29 presents the population projections for the numbers and percentages of schools that operate classrooms with combined grades.

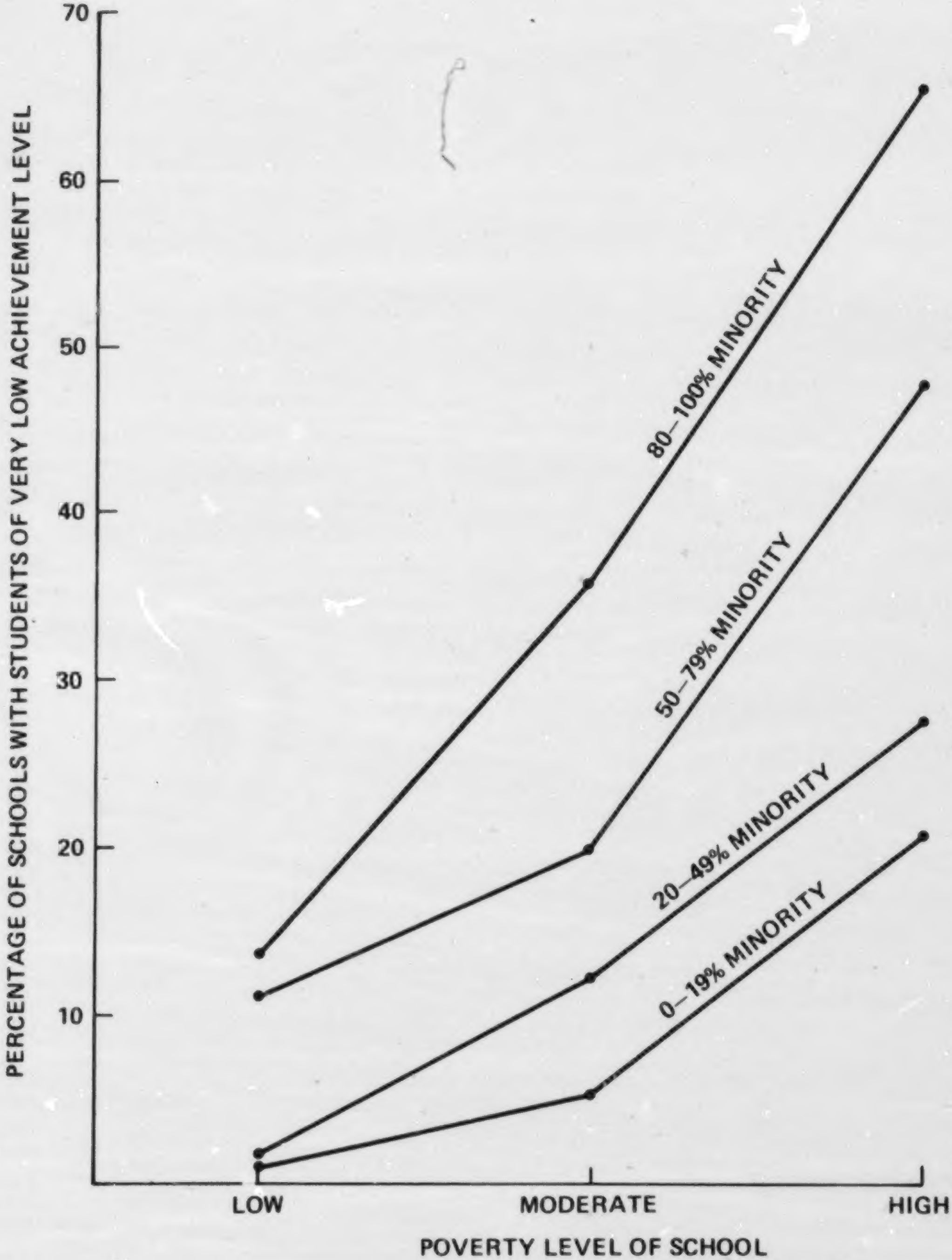


Figure VII-1

The Relationship Between Poverty and Very Low Achievement for Four Levels of Minority Concentration

## Table VII-28

## Projected Frequencies of U.S. Public Schools With Grades in the 1-6 Range by Grades Served

| Grade-Span Category | Projected Frequency | Projected Percentage |
|---|---|---|
| Complete Elementary | 41,942 | 67.1 |
| Feeder Elementary | 7,738 | 12.4 |
| Primary | 6,309 | 10.1 |
| Intermediate-Middle | 6,490 | 10.4 |
| Totals | 62,479* | 100.0 |

*The slight difference from 62,534 is due to rounding errors occurring during the individual weighting of sample schools.

## Table VII-29

## Projected Numbers and Percentages of U.S. Public Schools With Grades in the 1-6 Range that Operate Classrooms With Combined Grades

| Classroom Operation | Projected Frequency | Projected Percentage |
|---|---|---|
| Schools With Some Classrooms With Combined Grades | 26,535 | 42.5 |
| Schools With No Classrooms Having Combined Grades | 35,943 | 57.5 |
| Totals | 62,478* | 100.0 |

*The slight difference from 62,534 is due to rounding errors occurring during the individual weighting of sample schools.

*Incidence of Combined Grades and Enrollment.* A **gamma** of 0.061 was observed for the cross-tabulation between the incidence of combined grades and school enrollment that is presented in Table VII-30. The **V** statistic for the same data is 0.186. The operation of classrooms with combined grade-levels tends to be slightly associated with small schools having enrollments under 100. Among such schools, 65.2 percent combine grades within classrooms, whereas among all the larger schools the percent ranges in the thirties and forties. Since from Tables VII-6 and VII-18 we found that for the bulk of schools in the population enrollment is not strongly related to student poverty level or to percentage of low-achieving students, the findings here must be largely due to the small schools in rural areas that combine grades with small enrollments. This conclusion is consistent with those to be reached later in the discussion of Table VII-32.

*Incidence of Combined Grades and Grade Span.* A fairly high **gamma** of 0.310 was observed for the cross-tabulation of grade range with the incidence of combined grades, as presented in Table VII-31. This finding is trivial, since schools with wider grade ranges have a greater possibility of combining them. In all but the first category of schools, the complete 1-6 range, there were many one-grade schools that clearly could not offer combined-grade classes.

Table VII-30

Projected Percentages of Schools With Grades in the 1-6 Range by Incidence of Combined Grades and Enrollment

| | Incidence of Classrooms With Combined Grades | | |
|---|---|---|---|
| Enrollment in Grades 1-6 | None | Some | Total Counts |
| 1-100 | 34.8 | 65.2 | 5,704 |
| 101-200 | 69.1 | 30.9 | 12,086 |
| 201-300 | 52.0 | 48.0 | 12,523 |
| 301-400 | 59.2 | 40.8 | 12,723 |
| 401-500 | 58.3 | 41.7 | 8,255 |
| 501-600 | 59.7 | 40.3 | 5,151 |
| 601-700 | 58.7 | 41.3 | 2,722 |
| 701-800 | 68.5 | 31.5 | 1,608 |
| 801-1000 | 53.2 | 46.8 | 1,258 |
| 1001-2800 | 68.7 | 31.3 | 447 |
| Total Counts | 35,943 | 26,534 | 62,477 |

## Table VII-31

### Projected Percentages of Schools With Grades in the 1-6 Range by Incidence of Combined Grades and Range of Grades Provided

| Grade Range of School | Incidence of Classrooms With Combined Grades: None | Incidence of Classrooms With Combined Grades: Some | Total Counts |
|---|---|---|---|
| Complete (all 6 grades) | 52.3 | 47.7 | 41,941 |
| Feeder (mostly 1-5) | 61.1 | 38.9 | 7,738 |
| Primary (mostly 1-4) | 70.4 | 29.6 | 6,309 |
| Middle (mostly 5-6) | 74.5 | 25.5 | 6,490 |
| Total Counts | 35,943 | 26,535 | 62,478 |

*Incidence of Combined Grades and Urbanism.* A **gamma** of 0.145 was calculated from the cross-tabulation of school urbanism and the incidence of combined-grade classrooms presented in Table VII-32. This **gamma** indicates some relationship between the characteristics. There is a tendency for a somewhat greater relative incidence of schools with combined grades in the urban locations; less of an incidence in small cities; and a slight increase in incidence in the rural areas. This non-linear relationship is supported by the **V** statistic of 0.197. The non-linearity is likely the result of two different forces operating on the organization of schools. In the urban areas, where there is a high incidence of low achievement, it is likely that the achievement variation within any grade-level is very large, so that grouping children across grades by general level of achievement may be employed. In the rural areas, where there are still many very small and one-room schools, combined grades are simply a matter of practical necessity. These statements may appear to be mere conjecture, but they are reinforced by other findings in this report.

*Incidence of Combined Grades and Poverty.* The cross-tabulation of student poverty level and the incidence of combined grades is presented in Table VII-33. The relationship between the two characteristics is reflected in a **gamma** of 0.140. There is a slight tendency for schools with low poverty to have fewer combined-grade classrooms than schools with higher poverty levels.

*Incidence of Combined Grades and Minority Students.* The cross-tabulation of the incidence of schools operating combined-grade classrooms with the concentration of minority students is presented in Table VII-34. The **gamma** calculated from this relationship is 0.161, indicating a slight tendency for combined-grade classrooms to occur in schools with high minority concentration.

## Table VII-32

### Projected Percentages of Schools With Grades in the 1-6 Range by Incidence of Combined Grades and Urbanism

| Urbanism of School | Incidence of Classrooms With Combined Grades: None | Some | Total Count |
|---|---|---|---|
| City of over 500,000 | 35.0 | 65.0 | 4,547 |
| City of 200,000-500,000 | 44.2 | 55.8 | 2,428 |
| City of 50,000-200,000 | 45.3 | 54.7 | 6,652 |
| Suburb of city | 58.1 | 41.9 | 9,248 |
| City under 50,000 | 68.2 | 31.8 | 17,470 |
| Rural area near city | 62.9 | 37.1 | 6,596 |
| Rural area not near city | 56.8 | 43.2 | 15,540 |
| Total Counts | 35,945 | 26,536 | 62,481 |

## Table VII-33

### Projected Percentage of Schools With Grades in the 1-6 Range by Student Poverty Level and Combined-Grade Classrooms

| Percentage of Poverty Students | Incidence of Classrooms With Combined Grades: None | Some | Total Counts |
|---|---|---|---|
| 0-20% | 61.0 | 39.0 | 32,269 |
| 21-50% | 55.6 | 44.4 | 20,164 |
| 51-100% | 50.2 | 49.8 | 10,046 |
| Total Counts | 35,944 | 26,535 | 62,479 |

Table VII-34

Projected Percentages of Schools With Grades in the 1-6 Range by Incidence of Combined Grades and Minority Concentration

| Percentage of Minority Students | Incidence of Classrooms With Combined Grades | | Total Counts |
|---|---|---|---|
| | None | Some | |
| 0-19% | 60.4 | 39.6 | 42,732 |
| 20-49% | 51.6 | 48.4 | 10,220 |
| 50-79% | 53.4 | 46.6 | 4,526 |
| 80-100% | 49.1 | 50.9 | 5,001 |
| Total Counts | 35,943 | 26,536 | 62,479 |

*Grade Range and Student Achievement.* A **gamma** of 0.094 was calculated for the cross-tabulation presented in Table VII-35. The **V** statistic is 0.111. The greatest concentration of low-achieving students falls in the middle-school category, with the complete-range schools being second. The primary and feeder categories have considerably fewer schools, with high concentrations of students reading a year or more below grade-level. This relationship appears to be a trivial one, however, being the result of the association between grade-level and the probability (given the measuring devices employed) of a student's being one or more years below grade level. In other words, at the lower grades, standardized achievement tests do not extend down very far in terms of grade equivalents. On the basis of published norms, only about 10 to 15 percent of first- and second-grade students receive grade-equivalent scores one year or more below their grade. At the fifth and sixth grades, however, as many as 35 percent of the students receive grade-equivalent scores of one year or more below their grade-level. As a student advances from grade to grade there is more and more opportunity to fall behind in achievement, and this is reflected in the grade-equivalent norms of the tests.

In terms of policy, however, it would be inappropriate to interpret Table VII-35 as indicating a greater need for compensatory programs at the higher grades. Although such a need may exist, these data do not unambiguously demonstrate it.

*Incidence of Combined Grades and Student Achievement.* The cross-tabulation of student achievement level with the incidence of combined grades is presented in Table VII-36. The **gamma** computed from the cross-tabulation is 0.199, indicating a tendency for schools with more low-achieving students to have combined-grade classrooms, and for those with fewer low-achieving students to have no combined-grade classrooms. Whether or not this relationship is a result of the fact that the schools with many low-achieving students have such a wide range of student achievement that they must forego grade-level classrooms in order to provide appropriate instructional levels, cannot be determined.

Table VII-35

Projected Percentages of Schools With Grades in the 1–6 Range by Low-Achievement Rate and Range of Grades Provided

| Grade Range of School | Percentage of Students Reading One Year or More Below Grade Level<br>0–20% | 21–50% | 51–100% | Total Counts |
|---|---|---|---|---|
| Complete (all 6 grades) | 51.9 | 37.4 | 10.7 | 41,942 |
| Feeder (mostly 1–5) | 53.2 | 39.3 | 7.4 | 7,739 |
| Primary (mostly 1–4) | 60.1 | 31.1 | 8.8 | 6,309 |
| Middle (mostly 5–6) | 31.4 | 47.8 | 20.9 | 6,489 |
| Total Counts | 31,720 | 23,771 | 6,988 | 62,479 |

Table VII-36

Projected Percentages of Schools With Grades in the 1–6 Range by Incidence of Combined Grades and Rate of Low Achievement

| Percentage of Students Reading One Year or More Below Grade Level | Incidence of Classrooms With Combined Grades<br>None | Some | Total Counts |
|---|---|---|---|
| 0–20% | 62.3 | 37.7 | 31,719 |
| 21–50% | 55.1 | 44.9 | 23,771 |
| 51–100% | 44.1 | 55.9 | 6,988 |
| Total Counts | 35,943 | 26,535 | 62,478 |

## Three-Year Stability

The principals of schools in the Principal Sample were asked to provide estimates of the three-year stability of their student bodies. Stability of student body was defined in terms of the percentage of students, discounting graduating students, who remained in the school for three consecutive years. The data were projected to the entire school population and classified into the categories shown in Table VII-37.

### Table VII-37

### Projected Numbers and Percentages of U.S. Public Schools With Grades in the 1–6 Range by Stability of Their Student Bodies

| Percentage of Students Remaining in School at Least Three Years | Projected Frequency | Projected Percentage |
|---|---|---|
| 0–60% | 10,884 | 17.4 |
| 61–80% | 14,626 | 23.4 |
| 81–100% | 36,971 | 59.2 |
| Totals | 62,481* | 100.0 |

*The slight difference from 62,534 is due to rounding errors occurring during the individual weighting of sample schools.

*Three-Year Student-Body Stability and Enrollment.* The cross-tabulation of enrollment and stability of the student body, in terms of percentage of students remaining in the school for three years, is presented in Table VII-38. A gamma of 0.237 was calculated for the relationship, indicating a tendency for student-body stability to be related to enrollment. Inspection of the 0-60% column indicates that low stability rates range from a low 10.6 percent for the smallest schools to 34.2 percent for the largest ones in an almost monotonic manner.

### Table VII-38

### Projected Percentages of Schools With Grades in the 1–6 Range by Degree of Student Stability and Enrollment

| | Percentage of Students who Remain in the School for Three Years | | | |
|---|---|---|---|---|
| Enrollment in Grades 1–6 | 0–60% | 61–80% | 81–100% | Total Counts |
| 1–100 | 10.6 | 14.7 | 74.6 | 5,703 |
| 101–200 | 10.4 | 18.2 | 71.5 | 12,087 |
| 201–300 | 15.2 | 24.8 | 60.1 | 12,523 |
| 301–400 | 18.3 | 25.6 | 56.1 | 12,723 |
| 401–500 | 23.2 | 26.2 | 50.6 | 8,255 |
| 501–600 | 25.5 | 28.8 | 45.6 | 5,152 |
| 601–700 | 25.8 | 26.4 | 47.8 | 2,722 |
| 701–800 | 26.2 | 24.1 | 49.7 | 1,609 |
| 801–1000 | 24.0 | 29.3 | 46.8 | 1,259 |
| 1001–2800 | 34.2 | 21.4 | 44.3 | 447 |
| Total Counts | 10,882 | 14,627 | 36,971 | 62,480 |

*Three-Year Student-Body Stability and Urbanism.* The relationship between school urbanism and student-body stability is illustrated in Table VII-39. The **gamma** ratio for this relationship is 0.399, indicating a moderate relationship. From the pattern of the percentages, it can be seen that urban schools have less three-year-stable student bodies than fewer rural schools have.

Table VII-39

Projected Percentages of Schools With Grades in the 1–6 Range by Degree of Student Stability and Urbanism

| | **Percentage of Students who Remain in the School for Three Years** | | | |
|---|---|---|---|---|
| **Urbanism of School** | **0–60%** | **61–80%** | **81–100%** | **Total Counts** |
| City of over 500,000 | 45.1 | 29.3 | 25.5 | 4,546 |
| City of 200,000–500,000 | 36.1 | 34.9 | 29.1 | 2,428 |
| City of 50,000–200,000 | 30.8 | 27.2 | 42.1 | 6,652 |
| Suburb of city | 21.5 | 25.5 | 52.9 | 9,248 |
| City under 50,000 | 12.9 | 23.5 | 63.7 | 17,470 |
| Rural area near city | 9.7 | 21.5 | 68.7 | 6,597 |
| Rural area not near city | 6.6 | 17.7 | 75.6 | 15,540 |
| Total Counts | 10,884 | 14,625 | 36,972 | 62,481 |

*Three-Year Student-Body Stability and Grade Range.* The **gamma** computed for the relationship of student-body stability and grade-range of school, presented in Table VII-40, is 0.069, while the V is 0.058. This finding indicates that, taking entering and graduating rates into account, schools with different grade spans do not experience notably different degrees of student stability (or mobility).

*Three-Year Student-Body Stability and Poverty Level.* Poverty level of the school is slightly related to three-year stability of the student body, as indicated by a **gamma** of 0.197. The cross-tabulation of the two characteristics, projected for the population, is presented in Table VII-41. Among the low-poverty schools, 64.4 percent are in the high three-year stability group and 13.9 percent are in the low stability group. Among the high-poverty schools, on the other hand, only 49.3 percent are in the high three-year stability group and 27.3 percent are in the low stability group. Very similar relationships are observed between three-year stability and the percentage of minority students (Table VII-42), and between stability and the percentage of students reading below achievement level (Table VII-43). This indicates that poverty, minority status, low achievement, and three-year stability are all interrelated in today's society.

Table VII-40

Projected Percentages of Schools With Grades in the 1–6 Range
by Degree of Student Stability and Range of Grades Provided

| Grade Range of School | Percentage of Students Who Remain in the School for Three Years 0–60% | 61–80% | 81–100% | Total Counts |
|---|---|---|---|---|
| Complete (all 6 grades) | 18.0 | 23.7 | 58.3 | 41,942 |
| Feeder (mostly 1–5) | 18.4 | 27.6 | 54.0 | 7,738 |
| Primary (mostly 1–4) | 15.5 | 23.6 | 61.0 | 6,309 |
| Middle (mostly 5–6) | 14.6 | 16.1 | 69.4 | 6,490 |
| Total Counts | 10,884 | 14,625 | 36,970 | 62,479 |

Table VII-41

Projected Percentages of Schools With Grades in the 1–6 Range
by Student Poverty Level and Degree of Student Stability

| Percentage of Poverty Students | Percentage of Students Who Remain in the School for Three Years 0–60% | 61–80% | 81–100% | Total Counts |
|---|---|---|---|---|
| 0–20% | 13.9 | 21.7 | 64.4 | 32,268 |
| 21–50% | 18.0 | 26.2 | 55.8 | 20,165 |
| 51–100% | 27.3 | 23.4 | 49.3 | 10,046 |
| Total Counts | 10,884 | 14,625 | 36,970 | 62,479 |

*Three-Year Student-Body Stability and Minority Status.* A moderate **gamma** of 0.364 was observed in the cross-tabulation of three-year student-body stability with minority concentration (Table VII-42). Low three-year stability is more common (32.6 percent) among the high minority-concentration schools, and less common (12.6 percent) among the low minority-concentration schools. This finding is consistent with previous findings relating impermanence of student residence and school attended to minority-group membership.

## Table VII-42

### Projected Percentages of Schools With Grades in the 1–6 Range by Degree of Student Stability and Minority Concentration

| Percentage of Minority Students | Percentage of Students Who Remain in the School for Three Years | | | Total Counts |
|---|---|---|---|---|
| | 0–60% | 61–80% | 81–100% | |
| 0–19% | 12.6 | 20.8 | 66.6 | 42,732 |
| 20–49% | 26.6 | 30.3 | 43.1 | 10,221 |
| 50–79% | 29.5 | 30.5 | 44.0 | 4,526 |
| 80–100% | 32.6 | 24.8 | 42.6 | 5,002 |
| Total Counts | 10,885 | 14,626 | 36,970 | 62,481 |

*Three-Year Stability of Student Body and Achievement.* The gamma computed from the cross-tabulation of student achievement level with three-year stability of the student body that is presented in Table VII-43 is 0.244. The general trend of this moderate relationship is that schools with fewer low-achieving students have more stable student bodies, and schools with more low-achieving students have more mobile student bodies.

## Table VII-43

### Projected Percentages of Schools With Grades in the 1–6 Range by Degree of Student Stability and Low-Achievement Rate

| Percentage of Students Reading One Year or More Below Grade Level | Percentage of Students Who Remain in the School for Three Years | | | Total Counts |
|---|---|---|---|---|
| | 0–60% | 61–80% | 81–100% | |
| 0–20% | 13.0 | 21.7 | 65.3 | 31,720 |
| 21–50% | 18.8 | 25.7 | 55.5 | 23,770 |
| 51–100% | 32.8 | 23.4 | 43.8 | 6,988 |
| Total Counts | 10,883 | 14,625 | 36,970 | 62,478 |

**Summer Schools: Their Availability and Programs**

*Availability of Summer School.* Table VII-44 provides population estimates of the numbers and percentages of schools that in some way have summer-school programs available for their students.

### Table VII-44

### Projected Numbers and Percentages of U.S. Public Schools With Grades in the 1–6 Range by Availability of Summer School

| Summer-School Availability | Projected Frequency | Projected Percentage |
|---|---|---|
| Summer-School Programs Available | 31,851 | 51.0 |
| No Summer-School Program Available | 30,630 | 49.0 |
| Totals | 62,481* | 100.0 |

*The slight difference from 62,534 is due to rounding errors occurring during the individual weighting of sample schools.

*Summer School Availability and Enrollment.* Table VII-45 presents the cross-tabulation of school enrollment by availability/non availability of summer school to the students in the school. The **gamma** statistic for the observed relationship is 0.291, which indicates a fair degree of relationship between the two characteristics. There is a tendency for summer-school availability to be associated with larger schools. If previous interpretations are correct, it would follow that the small schools, being rural and remote, are less likely to offer summer-school programs to their students.

Because only 51 percent of the nation's schools operating grades 1-6 were projected to have summer programs of some type available to their students, it was not appropriate to project the relative frequencies of characteristics of the programs to the universe of schools. For this reason, sample cross-tabulations were made for the 2,412 schools in the Principal Sample that reported having summer-school programs available to their students.

Summer programs were classified into three categories: compensatory programs, regular/enriched programs, or some mixture of both types. These categories were cross-tabulated with other characteristics of the schools.

Beyond learning that about 51 percent of the U.S. public schools with grades in the 1-6 range make some form of summer-school educational program available to their students, it is of further interest to know where the summer programs are and what they offer. Due to the lack of population data on the specific number of summer schools by sampling cells, no attempt was made to project the frequencies and percentages of schools by location or type of programs offered. However, in both cases, unweighted analyses were performed of the observed frequencies and percentages for those schools in the Principal Sample reporting the availability of summer schools. The analysis for location of summer schools is presented in Table VII-46 and for types of programs in Table VII-47.

### Table VII-45

### Projected Percentages of Schools With Grades in the 1–6 Range by Availability of Summer Programs and Enrollment

| | Summer School Availability | | |
|---|---|---|---|
| Enrollment in Grades 1–6 | Summer School | No Summer School | Total Counts |
| 1–100 | 23.5 | 76.5 | 5,704 |
| 101–200 | 38.5 | 61.5 | 12,087 |
| 201–300 | 53.1 | 46.9 | 12,523 |
| 301–400 | 56.0 | 44.0 | 12,723 |
| 401–500 | 63.9 | 36.1 | 8,255 |
| 501–600 | 60.3 | 39.7 | 5,152 |
| 601–700 | 61.2 | 38.8 | 2,723 |
| 701–800 | 63.5 | 36.5 | 1,608 |
| 801–1000 | 59.1 | 40.9 | 1,258 |
| 1001–2800 | 59.3 | 40.7 | 447 |
| Total Counts | 31,851 | 30,629 | 62,480 |

### Table VII-46

### Locations of Summer-School Programs for Schools in the Principal Sample that Reported Having Summer School Available

| Type of Location | Observed Frequency | Observed Percentage |
|---|---|---|
| In the Survey School | 847 | 35.1 |
| In an Accessible School | 761 | 31.5 |
| In a District Center | 337 | 14.0 |
| Some Combination of the Above | 467 | 19.4 |
| Totals | 2,412 | 100.0 |

## Table VII-47

## Types of Summer-School Programs for Schools in the Principal Sample that Reported Having Summer School Available

| Type of Summer Program | Observed Frequency | Observed Percentage |
|---|---|---|
| Compensatory Program only | 1,258 | 52.1 |
| Regular or Enriched Program only | 308 | 12.8 |
| Some Combination of the Above | 846 | 35.1 |
| Totals | 2,412 | 100.0 |

Of the 2,412 schools that reported having summer programs available for their students, 2,048 (84.9 percent) had some type of compensatory instruction in language or reading; 1,665 (69.0 percent) had some type of compensatory instruction in mathematics; 540 (22.4 percent) had some type of compensatory instruction in other areas; 356 (14.8 percent) had regular subject instruction that permitted students to advance to a higher grade-level; and 969 (40.2 percent) had enriched instruction for qualified volunteer students.

*Availability of Summer School and Poverty Level.* The cross-tabulation of poverty level and the availability of summer school, presented in Table VII-48, resulted in a gamma of 0.144, indicating a slight relationship between the two characteristics. While schools in the low-poverty category are most likely to have summer-school available to their students, schools in the medium-poverty category are least likely to have it available. High-poverty schools are in between, with an almost 50-50 probability that summer school is available.

## Table VII-48

## Projected Percentages of Schools With Grades in the 1-6 Range by Student Poverty Level and Availability of Summer Programs

| | Summer School Availability | | |
|---|---|---|---|
| Percentage of Poverty Students | Summer School | No Summer School | Total Counts |
| 0-20% | 55.7 | 44.3 | 32,268 |
| 21-50% | 44.3 | 55.7 | 20,164 |
| 51-100% | 49.2 | 50.8 | 10,046 |
| Total Counts | 31,849 | 30,629 | 62,478 |

*Summer-School Availability and Minority Students.* The cross-tabulation of minority concentration with the availability of summer school, presented in Table VII-49, resulted in a

**gamma** of 0.129. This indicates a small degree of relationships between the two characteristics. Schools with high concentrations of minority students tend to have more summer schools available to them than schools with low concentrations of minority students.

Table VII–49

Projected Percentages of Schools With Grades in the 1–6 Range by Availability of Summer Programs and Minority Concentration

| | Summer School Availability | | |
|---|---|---|---|
| **Percentage of Minority Students** | **Summer School** | **No Summer School** | **Total Counts** |
| 0–19% | 48.7 | 51.3 | 42,732 |
| 20–49% | 56.2 | 43.8 | 10,220 |
| 50–79% | 50.5 | 49.5 | 4,526 |
| 80–100% | 60.2 | 39.8 | 5,001 |
| Total Counts | 31,850 | 30,629 | 62,479 |

*Availability of Summer School and Achievement.* A low **gamma** value of 0.087 was obtained for the relationship between student achievement and the availability of summer school. The cross-tabulation for these two characteristics, presented in Table VII-50, indicates no trends within the categories of the characteristics.

*Availability of Summer School and Funding Source.* The cross-tabulation of type of compensatory funds received with availability of summer school, presented in Table VII-51, resulted in a **gamma** of 0.168, which did not change when the Title I categories of funds received were reversed in order or combined. The observed **gamma** indicates a slight relationship, in which schools that receive Title I funds are less likely to have summer school available to their students than schools that either receive other kinds of compensatory funds only, or that receive no compensatory funds.

*Type of Summer Program and School Enrollment.* A **V** of 0.076 was computed between type of summer program and size of school (Table VII-52). Although there was some small trend for regular and enriched summer programs to be available to students in the smaller schools, the relationship is very slight, and may be the result of prorating 1-6 enrollments for schools containing other grades. For example, middle and intermediate schools will have small 1-6 enrollments because only part of the total school enrollment is in the 1-6 range. These schools are also more likely to have summer enrichment programs.

## Table VII-50

### Projected Percentages of Schools With Grades in the 1-6 Range by Availability of Summer Programs and Low-Achievement Rate

| Percentage of Students Reading One Year or More Below Grade Level | Summer School Availability | | |
|---|---|---|---|
| | Summer School | No Summer School | Total Counts |
| 0-20% | 54.0 | 46.0 | 31,719 |
| 21-50% | 46.4 | 53.6 | 23,770 |
| 51-100% | 52.8 | 47.2 | 6,988 |
| Total Counts | 31,849 | 30,628 | 62,477 |

## Table VII-51

### Projected Percentages of Schools With Grades in the 1-6 Range by Source of Compensatory Funds Received and Availability of Summer Programs

| Compensatory Funding Source | Summer School Availability | | |
|---|---|---|---|
| | Summer School | No Summer School | Total Counts |
| Title I only | 46.7 | 53.3 | 16,414 |
| Title I and other | 46.5 | 53.5 | 25,739 |
| Other funds only | 59.9 | 40.1 | 8,934 |
| No special funds | 60.4 | 39.6 | 11,392 |
| Total Counts | 31,849 | 30,630 | 62,479 |

*Type of Summer Program and Student Poverty.* The cross-tabulation of level of student poverty by type of summer program is presented in Table VII-53. The V statistic describing the relationship between the two characteristics is 0.131. Schools with low levels of student poverty that have summer schools are more likely to have enrichment or regular programs in their summer schools than schools with high levels of student poverty.

*Type of Summer Program and Minority Concentration.* The cross-tabulation of the type of summer program available with the concentration of minority students in the school is presented in Table VII-54. The V describing the relationship is 0.116, indicating a small relationship between the two characteristics. Among schools with high concentrations of

## Table VII-52

### Sample Percentages of Schools by Types of Summer Programs Available and Enrollment

| | Summer-Program Type | | | |
|---|---|---|---|---|
| Enrollment in Grades 1-6 | Compensatory | Regular or Enriched | Mixed Program | Total Counts |
| 1-100 | 58.6 | 14.9 | 26.4 | 87 |
| 101-200 | 60.8 | 12.0 | 27.2 | 316 |
| 201-300 | 53.4 | 12.2 | 34.4 | 491 |
| 301-400 | 50.8 | 14.3 | 34.9 | 533 |
| 401-500 | 45.3 | 13.3 | 41.4 | 406 |
| 501-600 | 48.7 | 13.0 | 38.3 | 261 |
| 601-700 | 51.8 | 11.3 | 36.9 | 141 |
| 701-800 | 57.8 | 10.0 | 32.2 | 90 |
| 801-1000 | 50.0 | 9.1 | 40.9 | 66 |
| 1001-2800 | 61.9 | 9.5 | 28.6 | 21 |
| Total Counts | 1,258 | 308 | 846 | 2,412 |

## Table VII-53

### Sample Percentages of Schools With Grades in the 1-6 Range by Types of Summer Programs Available and Levels of Student Poverty

| | Summer-Program Type | | | |
|---|---|---|---|---|
| Percentage of Poverty Students | Compensatory | Regular or Enriched | Mixed Program | Total Counts |
| 0-20% | 42.8 | 15.1 | 42.1 | 1,152 |
| 21-50% | 57.9 | 11.5 | 30.5 | 737 |
| 51-100% | 64.6 | 9.4 | 26.0 | 523 |
| Total Counts | 1,258 | 308 | 846 | 2,412 |

### Table VII-54

### Sample Percentages of Schools With Grades in the 1-6 Range by Type of Summer Programs Available and Concentration of Minority Students

| Percentage of Minority Students | Summer-Program Type |  |  |  |
|---|---|---|---|---|
|  | Compensatory | Regular or Enriched | Mixed Program | Total Counts |
| 0-19% | 49.2 | 12.3 | 38.4 | 1,337 |
| 20-49% | 46.6 | 17.7 | 35.7 | 513 |
| 50-79% | 55.7 | 11.1 | 33.2 | 235 |
| 80-100% | 70.3 | 8.0 | 21.7 | 327 |
| Total Counts | 1,258 | 308 | 846 | 2,412 |

minority students and with summer school available, the summer school is very likely to be compensatory and very likely to be regular or enriched. Among schools with the lowest concentration of minority students, regular and enriched programs are more common, but compensatory ones are still the most common.

*Type of Summer Program and Student Achievement Level.* The V coefficient between the type of summer program available and the achievement level of the students is 0.067, indicating a very small relationship between the two characteristics. The cross-tabulation is presented in Table VII-55. Because the category "mixed program" could be counted in either of the other categories, it is very difficult to ascribe any meaning to this small relationship.

### Table VII-55

### Sample Percentages of Schools With Grades in the 1-6 Range by Type of Summer Programs Available and Rate of Low Achievement

| Percentage of Students Reading One Year or More Below Grade Level | Summer-Program Type |  |  |  |
|---|---|---|---|---|
|  | Compensatory | Regular or Enriched | Mixed Program | Total Counts |
| 0-20% | 47.7 | 13.1 | 39.2 | 1,131 |
| 21-50% | 55.2 | 11.8 | 33.9 | 896 |
| 51-100% | 57.9 | 14.0 | 28.1 | 385 |
| Total Counts | 1,258 | 308 | 846 | 2,412 |

*Type of Summer Program and School Receipt of Compensatory Funds.* A V of 0.203 was computed between the source of compensatory funds and the type of summer-school program available. The cross-tabulation, presented in Table VII-56, indicates that schools receiving Title I or Title I and other funds are much more likely to have compensatory summer programs than schools not receiving any Title I funds. Schools that do not receive Title I funds are more likely to have regular or enriched or mixed programs than those that do receive Title I funds.

Table VII-56

Sample Percentages of Schools With Grades in the 1-6 Range by Type of Summer Programs Available and Source of Compensatory Funds Received

| | Summer-Program Type | | | |
|---|---|---|---|---|
| **Compensatory Funding Source** | **Compensatory** | **Regular or Enriched** | **Mixed Program** | **Total Counts** |
| Title I only | 65.5 | 9.8 | 24.6 | 560 |
| Title I and other | 61.7 | 8.4 | 29.9 | 927 |
| Other funds only | 35.8 | 16.7 | 47.5 | 408 |
| No special funds | 33.5 | 20.7 | 45.8 | 517 |
| Total Counts | 1,258 | 308 | 846 | 2,412 |

# REFERENCES

Aiken, H.H., and Staff of the Computation Laboratory. *Tables of the Cumulative Binomial Probability Distribution.* Cambridge: Harvard University Press, 1955.

Canyon Research Group, Inc. *Design Study of a Nationwide School Data Collection and Delivery System.* Westlake Village, CA: Author, 1975.

Cochran, W.G. *Sampling Techniques.* New York: Wiley, 1963.

Coleman, J.S. Recent Trends in School Integration. *Educational Researcher,* 4,7, 1975, 3-12.

Curriculum Information Center, Inc. *School Marketing Services.* Denver: Author, 1975.

Grant, M.V., and Lind, C.G. *Digest of Educational Statistics 1975 Edition.* Washington, DC: U.S. Government Printing Office, 1976.

Lord, F.M. Test Norms and Sampling Theory. *Journal of Experimental Education,* 27, 1959, 247-263.

Miller, H.P. *Impact of Updated Estimates of Children in Poverty on the Allocation of Title I Funds.* Washington, DC: U.S. Department of Health, Education, and Welfare, 1977.

Mueller, J., Schuessler, K., and Costner, H. *Statistical Reasoning in Sociology.* Boston: Houghton Mifflin, 1970.

National Institute of Education. *Evaluating Compensatory Education: An Interim Report on the NIE Compensatory Education Study.* Washington, DC: Author, 1976.

U.S. Congressional Budget Office. *Elementary, Secondary, and Vocational Education: An Examination of Alternative Federal Roles.* Washington, DC: 1977.

U.S. Department of Health, Education, and Welfare, National Center for Educational Statistics. *The Condition of Education, 1977, A Statistical Report.* Washington, DC: U.S. Government Printing Office, 1977.

U.S. Department of Health, Education, and Welfare, Office for Civil Rights. *Directory of Public Elementary and Secondary Schools in Selected Districts: Enrollment and Staff by Racial/Ethnic Group, Fall 1972.* Washington, DC: U.S. Government Printing Office, 1972.

*United States Government Manual 1974-75.* Washington, DC: Federal Register, National Archives and Records Service, General Services Administration, 1974.